# CASA Bulletin of Anesthesiology


Vol. 8, No.2, 2021

天际霞光入水中，水中天际一时红。唐。韩偓

摄影：汪红医生 From CASA

主编：苗宁
稿约：苗宁，麻浩波
排版：Frances Wu，苗宁
编辑：刘宇燕，张姗，陆晓薇，彭勇刚
校对：刘宇燕，张姗，陆晓薇，Driscoll K

# 目录

# 主编之言

## 重症监护（ICU）与麻醉

苗宁

ICU 的主要职责是救治危急重症病患，监测其生命体征变化、防治并发症和促进病人康复的"一条龙"设施，是集医疗护理，新型医疗设备和多学科协同治病的高层次的医疗服务。麻醉与 ICU 里的病患治疗紧密相连而又明显不同。ICU 的病人病程长，病情复杂，涉及的专科疾病多并需多科会诊和协同治疗。麻醉医生主要着眼于临床麻醉，对危重病人围术期的治疗和抢救别有心得但治疗病患相对单一，短期。除了为 ICU 病人气管插管，我们麻醉科医生还能做什么？

1. 麻醉科，ICU 和其他相关科医生护士组成快速反应组 （RRT），病患病情有恶化迹象时，RRT 床前快速评估和治疗，或者将患者转移到重症监护病房（ICU）和有关医院和科室，紧急救治或蓝色警报组（Code Blue），即心肺复苏救治组。
2. 部分困难气管插管，支气管镜检的麻醉
3. 急性镇痛管理
4. 镇静，镇痛下的一些手术操作
5. 大手术病患的术后会诊以及协同护理

麻醉医生除了在 ICU 更好的发挥自身的"长处"，更要正视我们的"短板"。这需我们不断地向各科医生学习，向日新月异，更替快捷的医学知识，技术，监测手段学习。

本期的主题重点在于重症监护和麻醉，新的技术与麻醉等。

期望经过我们麻醉人的共同努力和不懈学习，提高危重病人的手术安全性和成功救治率。

CASA 2021

# CASA 成功举办 2020 年线上年会（下）

黄佳鹏、汪红、刘恒意、曹锡清

2020 年 12 月 19 日晚 CASA 年会共有三个 Panel 讨论：

1. Diversity and Inclusion, moderator: Cathy Cao, MD, CASA First Vice President;

2. International Collaboration, moderator: Henry Liu, MD, PhD, CASA Former-President;

3. COVID-19 Vaccination and Well-being of anesthesiologists, moderator: Hong Wang, MD, PhD, and Immediate Past President of CASA.

**1. Diversity and Inclusion**

**Cathy Cao**: Joining me today are three distinguished panelists, Dr. Beverly Philip, President of ASA, Dr. Xinzhi Zhang, President of Federal Asian Pacific American Council and Dr. Corinna Yu, ASA Committee member of young physicians, assistant Professor at the Indianapolis University. My sincere gratitude goes to each one of you for your time and commitment. If anyone would like to ask questions, please put your question in the chatbox.

2020 has been an extraordinary year for science, an exceptional year for ASA, a very tough and challenging year for every CASA member. While frontline Chinese American anesthesiologists are fighting the Covid-19 pandemic in the hospitals, they also have to endure the stigma and hostile sentiment outside hospitals because President Trump keeps referring to the coronavirus as "the Chinese virus" and "Kung Flu". This double-fold stress and discrimination has caused a great deal of anxiety and mental health issues among our CASA members.

Dr. Xinzhi Zhang, you are a courageous leader against anti-Asian racism, would you please give us some examples of recent surge of anti-Asian attacks, and what we should do to build resilience and raise awareness?


**Xinzhi Zhang**: Thank you for inviting me. As Dr. Philip outlined in the mission of ASA, I hope many of CASA members will step up to become leaders of ASA. Today's topic is Diversity, Equity, and Inclusion. It has been a long journey for Asian Americans to come to the current point. As President Obama once said, there is no Red American, Blue American, we are all Americans, there are no white

Americans, black Americans, Latino Americans or Asian Americans, we are all Americans. "The journey of thousand miles begins with one step." It's essential for us to remember Dr. Martin Luther King's speech when we talk about the DEI issue.

About ten days (Dec. 9, 2020) ago, Chinese American WWII Veterans were honored with the Congressional Gold Medal (CGM). As Congresswoman Julie Chu mentioned during the ceremony that "Despite facing discriminatory laws like the Chinese Exclusion Act, which restricted their rights and treated them as second-class citizens, nearly 20,000 Chinese Americans valiantly served our country during World War II. These American heroes defended our nation's democracy and ideals abroad even as they faced racial prejudice at home." As an active-duty member as myself, it's very nice to know that those Asian American heroes finally got recognized for their contribution; at the same time, we have to ask why it took 75 years



Another thing that came cross to me is the fact that during the COVID-19 pandemic, as Dr Cao asked, Asian American Physicians as frontline healthcare providers have to endure the racial bullying and discrimination while saving patients' lives. The survey among 1000 high school Asian American students showed that 1 out of 4 Asian American youths have experienced racial bullying during the pandemic. A very consistent story published by Pew research found out that 40% Asian Americans and African Americans are experiencing racial discrimination now. At the same time, I am very happy to see our younger generation Asian Americans standing up and saying "No" to this kind of behavior. The reason we need to talk about DEI here is that you may not experience the discrimination yourself, your neighbors are very nice to you, your colleagues and patients respect you, you have no problem whatsoever. But, as a group, there is evidence out there of discrimination. For example, during the financial crisis in 2008, none of the large banks faced criminal charges, but one small New York bank owned by Chinese Americans was sued by federal government. They spent 10 million dollars to fight the case and won, proving they didn't do anything wrong. So what happened, why was the Chinese American banker singled out? I have to say from the incidence that you have to learn to protect yourself against racism no matter how rich you are as a physician.

Many times, we are very busy taking care of our patients, conducting research, writing grants, helping our kids to make sure they can go to the Ivy League. Seems we are too busy to do anything else. But, we can always find time to give back to our community and our country, especially during times of crisis. At Federal Asian and Pacific Island American Council, we work with senior leadership to fight discrimination. At the peak of the pandemic, we organized a webinar inviting Maryland first lady Yumi Hogan, Asian American politician, government leaders and prominent physicians to discuss the AAPI COVID-19 response. We really discussed

what happened with COVID-19 that this disparity affects different minor population and how different communities can work together to support each other to address the equity, diversity and inclusion issues. So there are things that we can always do and we certainly make an impact by working with each other to fight the coronavirus and to understand the culture and difference of different community and try to address the pandemic together.

Finally, I would like to highlight one of the programs which is called Future Star program. It's a mentoring program for high school students to bring them exposure to leadership, exposure to the public service, how to serve this country, how to give feedback to the community, for other things they will learn through the program over a year really to address the leadership including you, eventually improve the leadership diversity of Asian-American community and in overall society. Extremely talented high school students created a website with videos and articles on how to deal with stress and bullying by promoting mental and physical wellness, by creating a teen-friendly environment to a better world around us. This is an example of building the next generation of leadership for the AAPI community.

In conclusion, I will quote Mark Twains' remarks here because we do not want to regret in 20 years: "Twenty years from now you will be more disappointed by the things that you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore. Dream. Discover. "Let us work together, we shall not only help Asian American community, but every community of America. Hope many more of you will be the leaders to increase the diversity of leaders.

**Cathy Cao**. Thank you so much Dr. Zhang for your enlightening talk, we all learned a lot from our history, you just nailed it.

You also brought up another important diversity and Inclusion issue facing Asian Anesthesiologists—the under-representation in management and leadership positions. We are often viewed as a model minority with highest academic performance but least likely to be promoted. We call this phenomenon as the Bamboo Ceiling. Dr. Corinna Yu, I am overly impressed with your ASA Monitor article regarding the Asian model minority myth and bias. Would you please elaborate further on this issue?

**Corinna Yu**. Thank you so much for having me, thank you Dr. Cao and thank you CASA! I'll be talking about the Overrepresented Minority, Underrepresented Voice. I am given five minutes, I just pared down from a grand round lecture. I've prepared as a grand rounds if anyone is interested in more information at a further time. I'll briefly talk about past and present bias against Asian Americans, then discuss the effects of US immigration law and the US Census on Asian American representation in medicine and population health, at the end, I'll reflect on the exclusion of Asians and Asian Americans as an overrepresented minority in medicine while being underrepresented in voice.

As Dr. Cao has mentioned, this is the model minority myth formed in the 1860s, where in a New York Times article Mr. Peterson wrote that Japanese Americans could succeed in American culture better than other races. This is actually a myth, there were barriers to immigration and quotas in place, "no Japs!" Back then, Chinese were not allowed to do many jobs due to the Chinese Exclusion Act. As far as today's bias; multiple Asian American doctors have been told they don't belong here, "go back to China" was shouted at them, signs "we don't accept Chinese customers for coronavirus, thanks for understanding." We have an entire website for Stopping AAPI Hate that is collecting these incidents. So you can see that not much has changed then and now, that there is still this anti-Asian sentiment and its present within the historical immigration acts and as of more recently these are some of the four categories that we have for immigration. Historically, the US has denied and limited immigration from Asian countries.

1882 Chinese Exclusion Act

1892 Geary Act renewal, repealed in 1943 for 105 visas per year

1917 Immigration Act excluded "Asiatic Barred Zone"

1924 Immigration Act-National Origins Quota from 1890 national census

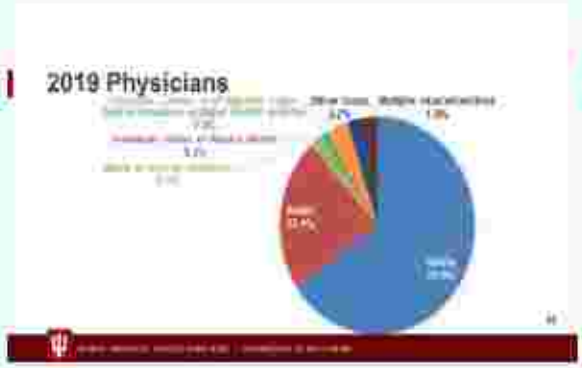
1952 Immigration Act ended Asian exclusion, 100 visas/country/year, but had racial not national quotas for Asian immigrants

1965 Immigration Act. Abolished national origins quota, preference system

1990 immigration Act. Visas can't exceed 7% from any single foreign state

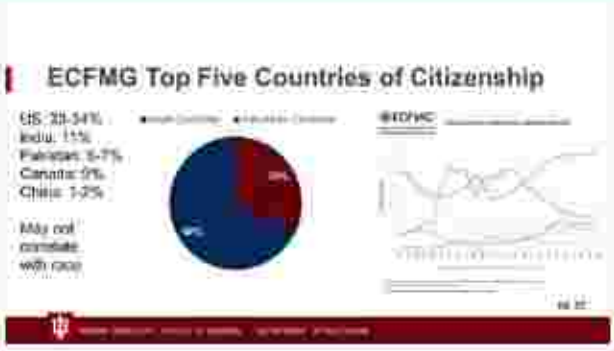

Now you can see here I've tried my best to collect the data that Asian countries actually make up 31 to 85 of the visas from these different four categories, so that's a lot, and we probably make up somewhere between 6.8% as of the last U.S. census, we'll see what 2020 has to say. But if you look at some of the census categories we've actually gone backwards in the past 100 years. Back in 1910 you can see that they used to track Chinese and Japanese separately and now in 2010 it was just Asian. You'll also notice, this is my 2020 census, they do categorize out a few of the different categories for different Asian ethnicities, but what's interesting to note is whether or not these racial categories are even relevant because in 2060 the two or more races category is going to increase the most. Asian is going to increase the second most as a category. However, data on Asian American population health is omitted, aggregated, and extrapolated US Census data may not fully capture Asian American population due to cultural barriers.

So when we look at some of the projections for physicians, the AAMC created some data and you can see here they don't even comment on Asians. But here they demonstrate Asians at 22.4% so clearly that's somewhere between three to four times what the national population of Asians might be. Medical students similarly at 22.5%, and if you look at what this category underrepresented in medicine is, back in 2004 they changed it from underrepresented minority, this is the AAMC, to underrepresented in medicine, because they wanted to make sure that we're really excluding this red portion of the pie. So these are all the minorities and now if you cut out the Asians you're looking at the underrepresented compared to population numbers, because Asians are an overrepresented proportion compared to the population. So we were excluded now as minorities. What does that mean? What does it look like? Well, you can see here doctoral degrees, med school applicants, active physicians, med school faculty, anywhere from 15 to 21%, so yes, we are overrepresented there; anesthesiologists somewhere between 15 and 19%, based on the best data that I could find.





There's actually a huge need for international medical graduates, we have 25% of our workforce coming from international medical schools. This does not mean that they're not US citizens, this does not mean that they're from foreign countries necessarily. If you look at anesthesiology residents and fellows, IMGs make up 13%, back in 2018 the match data 122 of those IMGs were from the US, it's hard to say what that racial makeup was, and then 120 were from foreign countries. But 22% of anesthesiologists are international medical graduates, and if you look at the ECFMG data they actually talk about the citizenship, and 32%--India, Pakistan and China here--came from Asian countries. So part of it is there is a need for additional physicians and some of them being from other countries, Asians and Asian Americans are overrepresented in medicine which can cause various issues, but the question is do we see that same number represented in leadership or not? We're definitely not there.

In government and I don't have the data for 2020 but you can see here in 2019 that we had 3 8% Asian US House Representatives, which is less than the population of Asians. As far as ASA leadership, there was one study done by Dr Cynthia Wong out of the House of Delegates from ASA that responded to a survey, maybe there was eight percent that were Asian. It's very difficult to say as we're not collecting the data to know, but I would suggest to you all that we are an overrepresented minority that does not receive attention because of the model minority myth, we are an underrepresented voice. I have several references of this talk



**Cathy Cao** That's excellent, we are so proud of you, Dr. Yu! You just raised an excellent question to our ASA President Dr. Philip, if 15-19% of anesthesiologists are Asian, we should expect similar proportion leaders to be Asian American, however, according to the 2017 Anesthesia and Analgia research survey, there were only about 8.7% Asians in leadership position in our specialty. Stereotypes and cultural differences contribute to this discrepancy. Dr. Philip, what is your advice for us to overcome this Bamboo Ceiling? What should we learn from other ethnic groups? Thank you.


**Beverly Philip** First of all, Dr. Yu, I would really like to compliment you for getting that message out, I think it is a true message and it needs to be aired. The definition of what a minority is needs to be very much broadened. I think there is a particular challenge on meshing with the American model when you don't come from that cultural background and that's absolutely correct.

What I do want to highlight is that fortunately some of your data is not up to date so we have some good news coming from the ASA side. Last year as the president-elect comes into this position, the big job of the year is to make the committee appointments, and I'm very glad to say that as best we know, that the percentage of various ethnicities and I'm not saying minorities, but ethnicities, in our organization on the appointments to the committee has been an active project of the president-elect for several years. I can tell you that my year that we

matched, that I worked to match the percentage of ethnicities on the committee representation that would match the ASA membership. This has been true for a couple of years now and I can vouch for this past year for sure. We are looking at this and we'll get back to what you guys are doing. But I can also tell you the big issue is the denominator. So I can match, and the president-elect of ASA can match, to the committees, but we don't have is a really good data of what our membership is like. So I got out the data for this past year, and we've had for several years on our membership application, when you renew your membership every year, a variety of options to identify with minorities, and I can tell you that across the board whether you look at the more senior members, the younger members, the resident members, somewhere between 90 and 95 percent of members declined to mention it at all. There is an option and they either leave it blank or they say decline to answer. So my request to you is one way to get better representatives, is to fill out that ethnicity statement when you become an ASA member. It in no way inhibits what you can do, in fact it gives you the option, of getting enough people in representation. As I said 95% of people don't answer. What we do know for the very few who did answer is we have data on that. In fact that the AMC reports about 15 percent anesthesiologists are Asian. I am delighted to tell you that's exactly what we're seeing in our membership, as the five percent who answer there is that percentage of Asians and it is fairly evenly distributed in the population. If you want more physicians just identify who you are and we can make it happen, we are trying to make it happen. Fortunately that seven percent is 2017, we are keeping better data now because we are concerned and there are opportunities there.

My advice for overcoming this bamboo ceiling on the smaller level is, I do like inside of ASA. ASA is one of the most genuinely representative organizations that I have ever worked in. We just need to know. So please as you renew your membership, tell us which ethnicity you identify with. Yes, there's two or more, but that doesn't really help. So please tell us who you are and the other thing that I would say that I would emphasize that I think particularly the Chinese-American community seems to be doing very well, is, engage. This is something that I think not most minorities do well enough, and I would reinforce your enthusiasm to get things done, to get involved, keep that up. Because ASA as an organization is merit-based. If you volunteer and you get an opportunity and you do it well, you're going to get more opportunities. So please for ASA, get involved get engaged, and there will be opportunities. There is a ceiling there, it does exist, but inside of ASA we can get together to make it better.

**Michael Champeau (First Vice President of ASA)**. I'm sure you may wonder what on earth can a white guy tell us about this issue, but I do have a few credentials to that. I would like to just share with you my main one is that for 40 years I've been married to a first-generation Chinese-American physician. Her family is from Shanghai, she was born in Taiwan, and like all of you she comes from a very accomplished family, both on this side of the pacific and in China. And I've heard this topic discussed at our family dinners for many years. Her family is filled with physicians and scientists and engineers, and this is something that I've heard discussed, so I'm in absolute agreement with Dr. Yu's comments.

I came up through California society and living here in California, I've been at Stanford University for 37 years, clearly we have a higher percentage of Chinese Americans in our department than you would see in other parts of the country and certainly the same way in the state. When I look at the membership roles of our California Society, I see so many Asians, certainly east Asians but also southern Asians. There are a lot of Asians and it's been clear to me that just what Dr. Yu is saying, the representation in the leadership just does not commensurate

with the percentage of the membership. So clearly there's an issue there and we need to do something about it. I think all of us and the leadership of the ASA have recognized that diversity equity and inclusion DEI, it's not just a black and brown issue that the bamboo ceiling is very real and that has already come up in some of the work group meetings. It's interesting because I'm on the board of FAER and I've been involved with the American Board of Anesthesiology for several years, and both of those organizations, because they select their leaders, their board members, they can go out and address these things much more quickly than we can in the ASA, where we have an elected board of directors, where the house of delegates and the board are all elected by their home states. And I agree absolutely what Dr. Philip said, ASA is a meritocracy. Many years ago the filmmaker Woody Allen said, 80% of life is showing up. I think that that's really true, when I look at my own career 25 years ago, I just showed up in California. But there's a difference between me and the Asian people, in that I knew that I probably would not be turned away, I knew that I would be welcome if I showed up. I think that we need a partnership between organizations such as yours to encourage people to show up because what Dr. Philip says is absolutely true in my experience that we are a meritocracy. If people show up and keep showing up, and do the work, people rise up. I think that we need to get the word out better, that we are a welcoming inclusive society, and that we're looking for people who are willing to show up and to do the work. ASA is very committed to this and we recognize that this is not just about underrepresented minorities in medicine, which we're looking at the leadership issue. We don't have that ability to just go out and pick a new board the way FAER or the ABA does, but we need to blend our meritocracy ethic with the encouragement that CASA can give to the Chinese American anesthesiologists.

**Cathy Cao**. Thank you Dr. Philip and Dr. Champeau, thank you Dr. Yu for your wonderful talk. I am looking at the chatbox for people's questions. May I have Dr. Mandell comment on the discussion please?

**Susan Mandell (President Society for the Advancement of Transplant Anesthesia)**. I just wanted to really point out how brave it was for people to mention that this is a social problem because what I've heard tonight is how hard we've worked in medicine to accomplish certain milestones, but somehow that doesn't translate into what's going on in the public sphere. And while we're sitting in our societies such as the ASA or whatever society it's been in trying to decide how to make things equal, how to include people, or how to get important resources of health care out to the public, we're somehow missing that step. I just worry that we're going to be taking a long time to move forward towards diversity, inclusion, and the absolute sharing of resources, unless we remember that even as physicians, no matter what society that we belong to, it ultimately is dependent upon us reaching the public, and making the public feel valued and providing them with adequate resources. So thank you, and I certainly don't want to pull up politics but about the Trump era comments regarding the COVID 19 and its relationship to Asians, were very damaging and thank you for being brave enough to mention that.

**Cathy Cao**. Thank you for your feedback, it's a great discussion, Dr. Mandell! Dr. Jiapeng Huang, our president, thank you so much for your exemplary leadership, I find out you are extremely effective and well-liked by the peers. Seems you always go above and beyond people's expectations. Would you please share with us the key elements of your success, how should we follow your footsteps? Please give us some closing remarks for this panel.

**Jiapeng Huang (President of CASA)**: As Asians, as immigrants, we always face obstacles. I think that's something that we kind of learn, but what one thing I don't want us to do is to get used to it. We should not be used to all the obstacles, we need to fight to overcome them and we need to get what we deserve. I think that there are always opportunities in leadership and sometimes you feel like I just want to take care of my own thing, I really don't feel like doing the leadership thing right now, but that's where you get it wrong. Every opportunity for leadership, you should get on it and demonstrate leadership, and that's how we can improve our own situation. I think we can ask anybody else, but it's really ourselves who are the ones who's going to decide that. Thank you for the excellent panel discussion.

## 2. International cooperation


**Henry Liu (former CASA president)**: As we all well aware of, the pandemic still ongoing, people travel in the USA significantly less domestically, international travel is even more difficult. Dr. Philip, as the ASA president, do you still believe we need international cooperation, and did ASA set up or plan to set up any specific program to promote international cooperation/exchange?

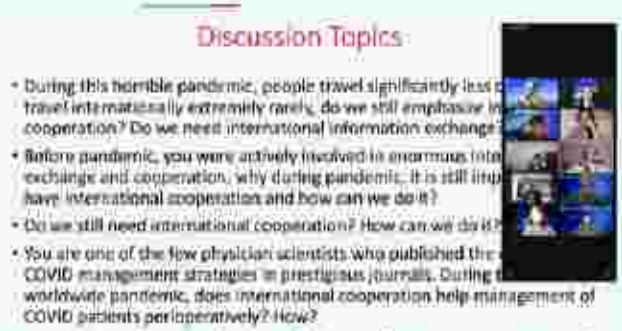
**Beverly Philip (ASA president)**: Yes, one of the regular and core activities of what ASA does is to join other major international societies of anesthesiology, to bring our specialty forward. Because indeed, it is ONE specialty we all belong to, no matter which country you are practicing at the moment. In different parts of the world, we have different expertise, different experience; if we can bring all these together, we can make our specialty better. We do need active international collaboration, since we are building this specialty together. So, it remains the ASA's strong interest to maintain strong international collaboration activities. For this year, we will meet other anesthesiology organizations' leaderships, of course virtually. We will try meet several times a year. We are also looking forward to it, not only in optimistic sense, but also in realistic sense. Since the pandemic is still ongoing, I would like to compliment People's Republic of China, they did a great job to lockdown the cities, to control the spreading of the COVID19. Unfortunately, we in the USA did not do a good job. As the pandemic situation coming down to a manageable level, we will continue our active, face-to-face collaboration. Because these face-to-face collaborations will be deeper, richer, and more productive. And I like to highlight international research, as this is a very strong component for both ASA and other international anesthesiology societies.

**Henry Liu: Dr. Davy Cheng**, before the pandemic, you were very actively involved in numerous international exchange/cooperation activities. Why do you believe during and beyond this pandemic, we still need international cooperation?

**Davy Cheng (Former Chairman of IARS Board of Trustees):** First of all, I'd like to thank CASA for inviting me as the representative of WFSA, World Federation of Societies of Anesthesiology. WFSA has 135 national society members, representing 150 countries. And personally, myself from Canada, sending our best wishes to everyone, also best wishes from IARS where I served as the Chair of the Board of Trustees. International cooperation is very

important, we must engage, especially in anesthesiology, as you heard earlier from Dr. Jerome Adams, the US Surgeon General, a very high-profile anesthesiologist. Now anesthesiology as a profession is mentioned by president and leaders in various parts of the world, especially in Europe. Truly we now have the platform to get the attention, and continue to push our profession forward. I always tell my faculties and residents, we must engage. As an old American saying, if you are not on the table, you may be on the menu. So, we must engage international societies. Look at what a central stage for us in critical care units, the pressure, the compassion, and the commitment we anesthesiologists have is secondary to none. As Dr. Philip mentioned, research and innovation without international collaboration are unimaginable. Talking about this pandemic, this is the very first time, we had the genome sequenced and published by scientists in Wuhan. Nine months after the outburst of the pandemic, we have vaccines administered to our high-risk population last week. And the vaccine had gone through Phase I, II, and III randomized clinical trials. This is remarkable, nine months of intense international collaborations. It is almost impossible to get all these done without international collaboration. We displayed leadership roles in our own hospital, by organizing airway management teams, teaching others how to manage airways and intubations. We have to advocate, to advertise our specialty, this is the time for us to shine. We do need to network and collaborate for our specialty. Hopefully, we can meet each other in 2021, not too far from now. Thank you!

**Henry Liu**: The Pfizer vaccine as a matter of fact is the product of international cooperation. The vaccine was co-developed by Pfizer and German teams. I would like to congratulate ASA for nurturing leaderships for the last several decades. Some ASA members become congressman, senators and other high level government officials. Dr. Shernan, as the SCA president, are you aware of anything specific in cardiac anesthesia that American cardiac anesthesiologists learned from outside of the United States?




**Stanton Shernan (SCA President)**: First of all, I'd like to thank CASA leadership for inviting me, participating this incredible meeting. As some of you guys might know, international cooperation is one of the top three items on the platform when I run for SCA presidency. I believe when we collaborate internationally, it is not only additive, there are some synergies there. As we bring the greatest minds together from entire world, we are not only learning from our success, but also learning from our failures. And we can hope improving upon the world. In terms of cardiac and thoracic anesthesia per se, I am not aware of anything specific. As we know, COVID is much organ-specific. During pandemic, I consulted anesthesia colleagues in Europe and Asia, asking them how to manage COVID patients. And for the very first time, SCA, EACTA and Chinese Cardiovascular Anesthesia Society are collaboratively preparing a guideline for the management of cardiovascular procedures for COVID patients. So, my response to your question is, it is not only important, but critical for us to collaborate, share experiences internationally, so we can have the best people with best experience to put together the best care for our patients.

**Henry Liu**: Dr. Lize Xiong, as the former CSA president, and currently a CEO of a hospital in Shanghai, what do you believe Chinese health system can learn from outside of the world?

**Lize Xiong (former CSA president)** Thanks CASA leadership for inviting me. It is very nice seeing you all. Yes, we learned a lot from anesthesiologists of other countries, including members of ASA, WFSA, and CASA. Every year, we invite anesthesiologists from ASA, CASA, and WFSA, to help train our young anesthesiologists. Chinese scientists sequenced the COVID virus genome and published on international journals, so scientists in other countries can save lots of time, to develop COVID tests and vaccines. When the pandemic is under control, hopefully we can meet face-to-face, we can have more collaborations. Thank you so much!

**Davy Cheng** Regarding to international collaborations, it is not limited to our profession, we also need cross different disciplines for collaboration. For example, Global Health Research Unit on Global Surgery in Birmingham, UK, has big data from multiple countries for surgery and perioperative care. It is very important in our domain. Surgery delay and cancellation will be other challenges for us for the coming 6-18 months. I'd like to encourage everyone to lead in your hospital and in our domain and profession to solve these problems and provide the best care to our patients.

### 3. COVID-19: Vaccination and Well-being of Anesthesiologists:


**Hong Wang (CASA Immediate Past President)**: US started the COVID vaccine a few days ago. As we know, the amount of vaccine is limited. The federal government has set up some priority guidelines. But each state and hospital have their own guidelines. In West Virginia, anesthesiologists were not at the top tier at first. We campaigned and went to the State Hospital Association. We are now the first group as well as the intensivists and emergency physicians. Dr. Phillip and ASA have recently issued a statement about the early access of vaccine by anesthesiologists.

Q1. How do we make sure we as anesthesiologists are in the top priority to receive the vaccination?

**Beverly Philip (ASA President)**: When it became clear that we will have the vaccine and the scheduling process has started, we heard from very early on from a broad spectrum of members across US which you have described first. There is a federal guideline but being interpreted differently at the various states and hospitals. In response to our members' request, we put out a statement to bring to your organization and to your hospital. This is simply a recognition of what we anesthesiologists have been doing. And another part of the answer is we can get this done if we remain engaged. As you have said, you have to go to your hospital and sometimes to your state health authority. We do need to stand up for ourselves. You may not get everything you would like to, but you surely will get more than if you said nothing. Take this statement, go to your leader, and keep up the good work!

**Hong Wang** Dr. Lize Xiong, I know China has not started vaccination yet. China is still conducting the phase III trial. Is there some discussion at the government level who will be the priority?

**Lize Xiong (former CSA President)** Thank you, Dr. Wang. You are right. Next month, we will have the vaccine. The priority will be for the people who have the high risk of exposure. More or less same as US. These people include hospital workers and airport workers. 15 million will be our first group.

**Hong Wang** Dr. Cheng, we would like to know how our neighboring country Canada is doing.

**Davy Cheng (Former Chairman of IARS Board of Trustees)** We actually got our first batch last week in Toronto. University Health Network has started. It includes 17 hospitals in Ontario. COVID 19 second wave is hitting us very hard. The priority goes to acute care hospitals and chronic care facilities. It is coming.

Q2. Vaccine impact on our practice such as work distribution.

**Hong Wang** I have invited Dr. Gioddano for this panel. Dr. Giordano is the Chair of ASA COSPA Committee. COSPA Committee is an ASA intersociety collaboration and relationship committee. Dr. Giordano, the vaccine supply is limited. What is the impact of the practice if only some of your members get the vaccine? Will only the vaccinated providers take care the COVID patients or high risk PUI patients? What happened if the recovery nurses did not have the vaccine, but the anesthesia providers did?

**Chris Giordano (ASA COSPA committee chair):** Dr. Wang, thank you for having me. These are pretty tough questions.

**Hong Wang** I know. I save the best for you.

**Chris Giordano** I am glad I don't have to answer these from the highest level. I can tell you what we are doing and what we are trying to accomplish. If you are taking care of COVID patients, as you have mentioned, you will be on the top tier. We are on a lottery to decide who will get the vaccine. Our daily allocation is 800 a day. In terms of who is going to take care of the COVID patients based on if you are vaccinated or not, I think I was fortunate that I was vaccinated on the first day. I do feel good about it since I have been vaccinated. Even though I still need the second shot, I feel more comfortable to take care the COVID patients than those who did not get the vaccine. But I don't think we have the full game plan to change our work distribution based on if we get the vaccine or not. We still don't know the long-term effect of the vaccine.

**John W Zhong (Associate Professor, University of Texas)** Chris, I think you will have the immunity one week after the second dose.

**Hong Wang** We vaccinated everyone in our department since we did not know if we should choose the high-risk providers or the high-risk exposures to solve this problem.

**Chris Giordano** I think we need be careful about this. Like the situation in Stanford. You do want to make sure that the front-line people will get the vaccine. We all try to learn from each other.

**Hong Wang** Dr. Jiapeng Huang, I heard your department had vaccinated differently for faculty, CRNAs or residents. Are there issues about this? Is this affecting the morale in your department? How do you decide the work distribution? Does this mean only vaccinated providers will intubate the patients?

**Jiapeng Huang (CASA President):** Thank you for the excellent question. We had the meeting very early on to decide who will get the vaccine first. We did not want everyone to get the vaccine at the same time due to the concern of serious side effects. So, we decided to take a stepwise approach. We discussed with the CRNA group. The general feeling is that the CRNAs do not want to be the first group. Our intubation team includes faculty and residents. Some faculty has been vaccinated. My vaccination is next Tuesday. So, if you do not hear from me next Tuesday, please check in. I think every department has to make its own decision on what strategy they will use. Ideally, we want to have a vaccine with side effect free and effective. But unfortunately, this is not true for any vaccine. So, I think for the benefit of the population, we as a physician should be the first in line to take the risk.

**Henry Liu (Former CASA President):** Our system has 3,500 people but only 1,900 vaccine. We are asking for volunteers to get on the waiting list for the vaccine. I am one of those volunteers.

**John W Zhong:** Kudos to you, Henry. I had the vaccine yesterday afternoon. I do not have any lingering effects. I ran 5k this morning, played tennis 3 hours, then played 9-hole golf.

Questions from the audience: What do you do if someone does not want to get the vaccine? What do you do then?

**Hong Wang:** The vaccine is not mandatory. We have three people who do not want to get the vaccine. There is an impact because of this. Fortunately, we only have three individuals. We ask for volunteers for the COVID team. The COVID team members take care of the COVID patients' surgery and intubation. This model will definitely not work for every department. We are fortunate that we have only three providers who refuse the vaccine.

由于时间关系，我们的 panel discussions 不得不在热烈讨论中结束，参会者意犹未尽，期许疫情早日结束，来年团聚。汪红前任主席提出会员身心健康 Well-being 议题留着今后会议再讨论。

(全文完)

# 麻醉技术应用讲座

## 麻醉中喉罩的应用

李娟教授
中国科学技术大学附属第一医院南区麻醉科

周星光教授
耶鲁大学医学院麻醉科

李娟教授

气道管理是围术期麻醉管理的重点和难点问题之一，喉上气道设备作为气道管理的一种工具，具有操作简便、易于放置、侵入性和刺激性小、以及操作相关的不良反应少等诸多优势。目前喉上通气已经成为临床麻醉、重症医学和急诊医学(包括院外急救)中气道管理的重要技术，并且广泛受到国内外困难气道指南和复苏指南的推荐应用。

周星光教授

第 291 期新青年网络公开课非常荣幸地邀请到美国耶鲁大学纽海汶医院麻醉系周星光教授、中国科技大学附属第一医院麻醉科李娟教授莅临讲堂授课。两位教授从理论出发，以实践为基础与广大同道共同探讨了喉上气道装置的临床应用相关问题。现将课后互动环节内容整理如下，供大家参考。讲课的详细内容-"喉上气道的临床应用：从基础到前沿"已经录制为视频，有兴趣的同行可以在新青年视频中心了解讲课内容。

1. 在使用喉罩通气时，如果存在漏气该怎样处理?

李娟教授：喉罩漏气的原因可能有两个。如果在置入时漏气可以拿出后重新放置一次。对于充气式喉罩，需要检查充气量是否合适，如果充气过多也会导致喉罩不服帖而漏气。如果在使用过程中漏气可能有两种原因，最常见的原因为麻醉深度减浅，患者有自主呼吸，腹腔压力增加导致漏气，腹压如果 > 25 喉罩则较易漏气。处理措施即为加深麻醉深度，比如肌松药或瑞芬太尼，抑制自主呼吸。另外一种原因为外科操作或患者体位改变导致喉罩移位，造成漏气，比如靠近头颈部的手术（如甲状腺手术）。

周星光教授：李教授回答很精彩。她上面所说的二个原因是喉罩型号大小不合适和罩囊充气压不合适。另一个原因是后面问题 7 将涉及到的，通气管腔形状不适合患者的自然气道形态结构而影响喉罩的密封。

2. 肥胖患者使用喉罩应该注意什么?

李娟教授：对于肥胖患者，喉罩一定选择二代喉罩，同时避免应用柄弯曲度固定的喉罩，可用如 i-Gel 等，Supreme 等不适用。

周星光教授：如果单纯按体重，很多肥胖患者都无法用喉罩，但是实际情况并非如此，因此首先应评估病人的气道。常识认为肥胖患者多有困难气道和胃液分泌，事实上这些都缺乏证据。真正的问题是 FRC 所致的安全窒息时间较短，通气阻力比较大，而预给氧往往做得不好。因此预给氧时应该集中精力，同时将手术床头尽量抬高。准备二套不同的喉罩，使用双管喉罩配胃管，适度的麻醉和小剂量肌松剂降低喉部肌肉和声门的张力，注意术中防止肺不张。

3. 使用喉罩前是否必须使用气道干燥剂?

李娟教授：使用喉罩前不需要用气道干燥剂。

周星光教授：如李教授所说，不常规用，因为气道太干会影响纤毛的功能。如果诱导时发现病人分必液多，可以适量。

4. 产科全麻双管喉罩的使用是否普及？优势何在？

李娟教授：产科手术应用二代喉罩比较普遍，我院产科应用较多，一定要用第二代喉罩。产科手术按饱胃处理，需要放置胃管进行吸引，第二代喉罩密封压较好，吸出胃内容物后可以进一步减

少反流误吸风险。优势即非常快捷，在孩子取出后即可应用少量丙泊酚和瑞芬进行喉罩置入。气管插管刺激非常大。

周星光教授：东西方差异悬殊。如李教授所说，中国和部分亚洲国家用于择期剖宫产，但西方国家目前仅限于急症剖宫产时的困难气道。

5. 紧急气道管理时室息氧合技术能否预防低氧？

李娟教授：困难气道的患者如果喉上通气失败，很多医院不具备高频通气设备，喉上通气失败意味着可能有气道塌陷、淤血、出血或水肿等，高频通气也可能不能发挥有效作用，紧急情况下面罩给氧有困难应该做气切治疗。

周星光教授：室息氧合是近十年来的新技术，用于有准备的困难气道和择期气道管理可以明显延长安全室息时间。从早期的 THRIVE（Transnasal Humidified Rapid-Insufflation Ventilatory Exchange）(Anaesthesia 2015; 70: 323-9) 到 SGHV, SJV (Supraglottic jet ventilation.) (UPenn 魏华锋教授)到最近的低流鼻氧(A&A 2020; 130: 831-9)都证明室息时间可以延长至十几分钟甚至四十几分钟，但是必须先有准备和预给氧。紧急气道时往往都没有准备，也没有时机，也很可能无法做对照研究。

6. 使用喉罩时，肺保护性通气策略怎样实施？应该注意哪些问题？

周星光教授：一方面基本上肺保护性通气措施都可以实施，另一方面用喉罩的病人都不是急症或者危重病人，因此管理也相对简单。漏气压是限制因素，但是自主呼吸配合正压辅助(SV+PSV)是喉罩的绝对优势。

7. 对于喉结比较高的患者在放置喉罩时有哪些技巧？

李娟教授：对于喉结较高的患者，建议使用没有弯曲弧度的二代喉罩，比如 i-Gel, air-Q。有弯曲的喉罩对喉结高的患者对位一般较差。

周星光教授：非常正确。对于喉结高或者说是小下巴和双下巴的患者，很多第二代喉罩所具备的预弯曲(preformed curve)固定弧度的通气管腔并不适合这些患者的咽喉形态特征，从而影响罩体与喉头的吻合。而 I-gel 通气管腔的弧度相对可塑，因此其气道形态适应能力较好。这实际上就是很多人认为 I-gel 和第一代喉罩 LMA-Classic 好用的原因，尽管没有几个人明白为什么。这些内容在讲座的第一部分中都已强调。Air-Q 尽管也是预成形的通气管腔，但其材料较软，因此对气道形态的适应能力也较好，这可能是儿科麻醉医生喜欢的原因。

8. 对于纤支镜检查手术，使用插管型喉罩和声门上高频通气，哪种方式会更好？

李娟教授：纤支镜检查我院不使用插管型喉罩，插管型喉罩可能妨碍支气管镜检查医生的操作。我院多使用 I-Gel 喉罩。声门上高频通气可能会更有利于纤支镜检查。I-Gel 喉罩一旦患者有缺氧可立即进行通气。

周星光教授：第二代喉罩问世之前，支气管镜检查很多时候是采用(浅度)全麻/深度镇静加自主呼吸(SV)或者间隙性面罩正压通气(IPPV)。现在很多医院将 SV 和 IPPV 换成了 SGV 或者 SGHV。依目前已有资料，SGHV 应该可以提供足够的时间完成大多数常规支气管镜检查。SGA 的优势是可以随时通气和检查时间可以延长。

9. 对于困难紧急气道，喉上通气失败时的处理措施？（高频通气，气切）？

李娟教授：困难气道的患者如果喉上通气失败，很多医院不具备高频通气设备，喉上通气失败意味着可能有气道塌陷，淤血，出血或水肿等，高频通气也可能不能发挥有效作用，紧急情况下面罩给氧有困难应该做环切/气切治疗。

10. 对于需要侧头，头部需要术中调动的患者，如何选择喉罩呢？

周星光教授：影响最小的是可弯曲喉罩，但现在的可弯曲喉罩缺乏胃通道，最容易漏气的是预成型固定弧度的喉罩如 LMA-Supreme。因此，目前 I-gel 或者 Baska 是比较好的选择，将来多通道可弯曲喉罩很可能成为最佳选择。但是最重要的是麻醉医生与外科医生的沟通和相互理解，术中密切监视气道情况，能够随时应急。不主张手术床头掉转 180 度。

11. 喉上通气装置与气道保护的关系？现有喉上通气装置临床应用的主要担心是什么？

李娟教授：外科都提倡 ERAS 微创腔镜，喉罩给大家的普遍印象（并发症）是误吸，其实双管喉罩解决了很多问题，外科减轻应激的措施为腔镜，麻醉科减轻应激的措施为喉罩。二代喉罩有很好的密封压，且有胃管，所以气道保护没有问题，临床无需担心。对于绝对饱胃患者，急诊患者不推荐应用喉罩，有选择应用喉罩的话，其安全性非常高。

周星光教授：喉上气道或者喉上通气装置对(下)气道的保护是通过密封覆盖喉头来实现的，同时这种密封也导致了人工上呼吸道(喉罩的通气管腔)与自然下呼吸道(气管和喉头)之间的"端对端"吻合，这种吻合不同于气管导管与气管之间的"管套管"吻合。喉罩与喉头之间端对端吻合的密封是脆弱的，也是相对的和动态可变的(TACC 2019, 26-27:42-47)，取决于罩口面与喉头的对位和相对空间(密封压力)、头颈位置和外部牵拉，而喉罩对下气道的保护取决于二者吻合的密封性和喉部环境卫生。现在和将来，使用 SGA 最主要的担心仍然是误吸，因为气道与消化道在咽喉部是相通

而不可真正分离的。然而，近二十年的临床应用表明，正确地使用第二代喉上气道，误吸的风险并没有增加。

12. 双侧声带麻痹可以用喉罩吗？

周星光教授：双侧声带麻痹与肌松时的情况是相当的。喉罩的优势是一侧声带麻痹时可以不担心损伤另一侧。

13. 喉罩可以用于 ICU 重症患者呼吸道管理吗？

李娟教授：对于简单短期通气可以，但喉罩不能用于长期通气。长期通气仍需气管插管。

周星光教授：同意，主要是作为过渡用。长时期使用不保险，容易脱落，又不容易保持呼吸道清洁。

14. 判断喉罩对位良好的标准是什么？金标准是什么？

李娟教授：双管喉罩置入后，1，放置胃管，2，呼气末二氧化碳曲线，3，实际潮气量＞80%设定潮气量。

周星光教授：李教授回答得很好，课中也有全面的讲解。必须注意，对位和通气不是一回事。

15. 做腹腔镜手术肌松药怎么用？如何保证气腹？

李娟教授：国外吸入麻醉应用笑气及其他吸入麻醉比较普遍，腹腔镜手术是否应用肌松药和外科操作技术有关，国内不建议效仿。腹腔镜头低脚高位对气道压影响较大，应用肌松药物可使喉罩更服帖于口腔。

周星光教授："喉罩不能肌松"是早期的迷误(BJA 2001; 86:749-53)，近二十年的全世界临床经验基本上证明那种说法说是错误的。遗憾的是目前麻醉界无人公开表态。肌松药该怎么用就怎么用，很多时候还能帮助喉罩的密封和通气，防止喉痉挛。大多数病人腹肌并不是很强壮，气腹不是问题，小剂量(10-20mg Roc)就能达到效果。关键是插 Trocar 的时候，腹部张力会让外科医生难以掌握力度，因此我一般在铺巾的时候会给予适量的肌松。以后就依手术情况和通气情况而定，有时候是不需要用的，手术后期 PSV 也是可能的。多数情况下外科医生根本就无法区分是否有肌松剂，有些外科医生看到肠蠕动也会要求肌松，可见一些人的无知。有时候是他们遇到困难不知所措，缺乏自信。遇到这样的人，你可以跟他们开玩笑，说你担心"肌松剂太多了会导致心肌阻滞和心跳骤停"，看他们是否理解。当然监测和拮抗是必需的。

16. 侧卧位和俯卧位时，咽喉部和口咽部的角度改变，如何保证喉罩不移位？

李娟教授：俯卧位、侧卧位手术，如脊柱外科手术，我院大部分腰椎手术会选择喉罩麻醉，在选择头垫时，马蹄形头垫对于颈短的患者容易造成喉罩移位，选择硅胶垫或平枕去掉一侧，如周教授课件中所展示的，不同的头垫患者头侧向一边，可以保证喉罩位置，喉罩选择不易移位的喉罩，如 i-Gel。柄弯曲(固定弧度) 的喉罩比较容易移位。

周星光教授：侧卧位将颈椎保水平。俯卧位头微偏<45 度，将上胸部尽量垫高一点，伸颈。肥胖和颈短的病人最好用类似 I-gel 的通气管腔弧度微弯微软的的气道装置。

17. 小儿喉罩如何放置？

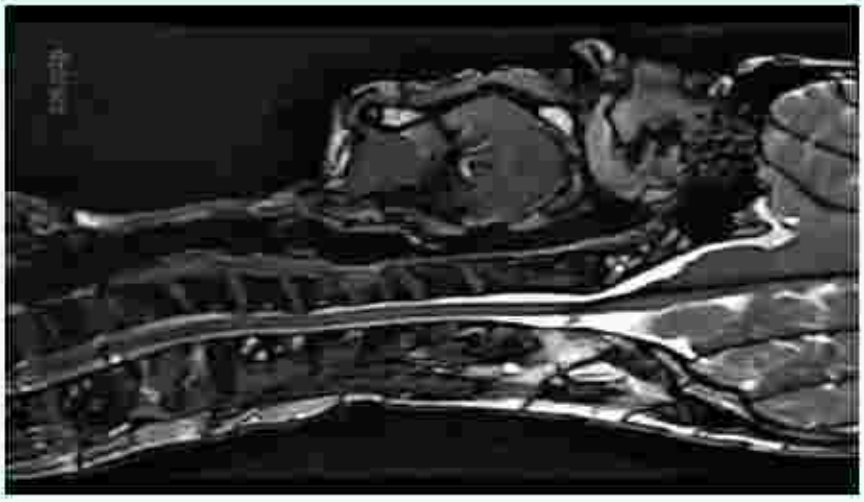
周星光教授：由于分泌液多，喉痉挛多见，由于会厌相对大，容易产生阻塞。因此必须掌握好这二个问题的及时诊断和处理。

18. 关于胸科手术中使用喉罩联合封堵器的问题，您的改良是经喉罩插入气管导管后再放封堵吗？还是仅仅经喉罩放置封堵器？

周星光教授：LMA+ET+BB or LMA+BB 都不是，这二种方法都是已经报道了很多的方法。我提倡的方法是 LM+BIT (bronchial isolation tube)，目前仍在探索阶段。

19. 对于使用 supreme 等固定弧度喉罩患者是是去枕平卧，还是垫上枕头？

周星光教授：正确使用枕头或者类似的头垫有助于开放咽喉空间和调节舌根位置(sniff position)，有利于喉罩的密封和通气。



20. 扁桃体手术用哪种喉罩？

李娟教授：扁桃体手术应用可弯曲喉罩，必须与外科医生配合，使用喉罩开口器装置，保证喉罩不易移位，良好通气，外科也可进行手术。如外科不能配合不建议应用喉罩（行扁桃体手术）。

周星光教授：是的，必须用可弯曲喉罩否则会干扰手术视野；同时也要配用合适的开口器，否则会导致通气道梗阻。喉罩用于扁桃体摘除是最高级和最富有挑战性的应用，千万不要轻视其潜在危险，麻醉医生和外科医生必须密切配合并具有足够的临床经验。

21. 胸科手术喉罩保留自主呼吸的经验？

周星光教授：没有任何经验。文献中有一些病例报告，临床研究好像主要来自意大利和中国，包括广州和台湾地区。

油画：春色满园，风暖翠捲

Qian Qiubing, MD Department of Anesthesia, Ocean Medical Center, NJ

Case reports

# Anesthetic Management for the Resection of an Adrenocortical Carcinoma invading the Inferior Vena Cava

Lin Tang, MD, Ph.D.,
Andrew Mannes, MD,
Department of Perioperative Medicine, Clinical Center, National Institutes of Health,
Bethesda, Maryland

## Introduction

Adrenocortical carcinoma (ACC) is a rare malignancy with an annual incidence of approximately 0.5-2 cases per million people [1]. Poor prognosis is related to delay in diagnosis and to the lack of effective adjuvant treatment [2]. Surgery remains the most effective treatment, and complete resection is the most consistently cited prognostic factor for long term survival [3,4]. However, despite complete resection, 70-85% of patients develop recurrence locally or distantly, which partially accounts for the poor 5-year survival. Involvement of inferior vena cava (IVC) was primarily reported in single case reports or small series with the exception of Chiche et al [5], but recurrent ACC with caval extension has not been described. Here we present a case of recurrent ACC with liver and lung metastases (mets) and mass extending into the IVC in a young patient who has shown evidence of stable disease after 8 cycles of chemotherapy. The purpose of this report is to discuss the anesthetic management of a patient who underwent retroperitoneal pericaval mass resection including vena cava resection and reconstruction with interpositioned Gore-Tex graft, and resection and ablation of multiple liver mets.

## Case Report

An otherwise healthy 36 year-old female with recurrent ACC with liver and lung metastases, had a previous open right adrenalectomy (15.8 cm tumor), nephrectomy, pericaval node dissection, and removal of adrenal vein thrombosis at another hospital about one and a half years prior to her presentation at our institution. Seven months after the initial surgery, her repeat imaging showed interval development of multiple hypodense liver lesions suggestive of metastatic disease. She received mitotane, cisplatin, doxorubicin and etoposide as adjuvant chemotherapy, and responded positively to 8 cycles of treatment with evidence of stable disease. She was referred to NIH Clinical Center for evaluation and possible surgical intervention.

Her preoperative labs including CBC, chemistry panel, liver function tests, coagulations and alpha-fetoprotein were all normal. Her EKG findings were unremarkable. A CT of chest and abdomen revealed a soft tissue mass in right adrenalectomy surgical bed (3.1cm x 2.9 cm), near complete effacement of adjacent IVC (Fig 1), and multiple hypoattenuating hepatic lesions and bilateral pulmonary nodules, consistent with metastatic disease. Magnetic resonance imaging (MRI) confirmed a focal lesion (2.6 cm x 1.8 cm) at the right adrenalectomy surgical bed that appeared to extend into the IVC. There was also a possible non enhancing component of this lesion in the IVC suggesting a bland thrombus (Fig 2). No further preoperative cardiac work up was indicated due to her age and lack of any significant cardiac history.

Pre-operative planning:

Due to the nature of the surgical procedure, (*i.e.* Re-exploration, liver and recurrent mass resection with possible IVC involvement), there was a very high risk of significant intraoperative bleeding. The blood bank was notified about a potential massive blood loss. Six units of packed red blood cells (pRBC) were ordered on the morning of the surgery. The Belmont rapid infuser RI-2 (with max rate 750ml/min) was brought to the operating room (OR). The patient had been prescribed hydrocortisone supplement for adrenal insufficiency, and was given stress dose steroids (100mg hydrocortisone) intravenously *(IV.)* on the morning of the surgery. The anesthetic plan included a preoperative thoracic epidural for postoperative pain control and general anesthesia with standard ASA monitoring. After pre-oxygenation, the patient was induced with *IV.* Fentanyl, Propofol and Cisatracurium, and was smoothly intubated with a 7.0 endotracheal tube under direct laryngoscopy. Anesthesia was maintained with Sevoflurane and Cisatracurium infusion. After intubation, two large bore 16 gauge peripheral *IV and* a 20 gauge arterial catheter were placed. Hypothermia was prevented by intravenous fluid warmer, upper and lower body heated air blankets.

Intra-operative course:

The patient was positioned supine on the OR table and a modified midline right subcostal extension incision was made. Upon the initial mobilization of liver and inspection of peri-caval mass, it was noted that there was tumor thrombus inside the vena cava adjacent to the palpable mass. The initial surgical approach included three wedge resections of liver, left partial hepatectomy, deep liver lesion ablation, and resection of diaphragmatic adhesions with liver mass. During this period, the patient was fluid restricted in order to avoid liver engorgement and hemorrhage. The estimated blood loss (EBL) up to this point was about 600ml, and the patient remained hemodynamically stable.

The second part of surgery was to resect retroperitoneal mass extending to the cava. There was significant scarring at the previous right adrenalectomy surgical bed. The surgeon was able to dissect and mobilize the mass that extended down to the left renal vein. With IVC cross-clamping, the tumor was resected off of the IVC, the cava opened, and the tumor thrombus removed. In anticipation of decreased ventricular preload with IVC cross-clamping, volume loading and phenylephrine infusion were initiated.

There were several brief hypotensive episodes secondary to tumor manipulation, each lasting less than five minutes. These episodes were treated with a combination of rapid transfusion of blood products to catch up with blood loss and phenylephrine infusion to counteract hypotension. The blood loss for this portion of surgery was estimated to be 5 L. The vena cava repair was

attempted with direct suturing, followed by a bovine pericardial patch to the vena cava. These attempts failed due to poor tissue quality. Ultimately, the friable portion of IVC was resected (below the hepatic vein to the level of left adrenal vein) and reconstructed with a graft. To facilitate this repair, the IVC was cross-clamped for multiple episodes, the longest being 57 minutes. Patient's hemodynamics were supported by rapid blood transfusion and phenylephrine infusion. At the end of the repair, the total EBL was 17L.

The massive transfusion protocol (MTP) was activated early during the case in anticipation of substantial blood loss. Arterial blood gas (ABG) with electrolytes were analyzed every 30-60 minutes using point-of-care testing (iSTAT 1 Analyzer, Abbott, MN 300-G) in order to guide blood loss resuscitation. Calcium chloride and magnesium sulfate were administered as needed. Hyperkalemia (K+ of 6.7) was treated with insulin, calcium chloride, and hyperventilation.

In total, the patient received 36u of packed red blood cells (pRBCs), 20 u of fresh frozen plasma (FFP), 4-pack (22u) of platelets, 10 u cryoprecipitate, 800ml of 25% albumin, and 10 L of lactated ringer's solution and 0.9% normal saline. Due to continued bleeding and the duration of the surgery (11 hours), the surgeon decided to pack the abdomen and transfer the patient to ICU intubated and sedated to stabilize prior to resuming the procedure on the next day. The final ABG leaving the OR was PH 7.36, PaCO2 37, PaO2 349 on 100% oxygen, bicarbonate 21, base excess -4, sodium 147, potassium 4.3, calcium 0.93, Hgb 7.1, and oxygen saturation 100%. The patient's body temperature had been maintained above 36°C throughout the case.

The patient's hemodynamics remained stable without requiring any pressors overnight in the ICU. Thromboelastography (TEG) test was sent and results indicated more platelet transfusion was indicated. Heparin infusion was initiated at a low dose due to IVC graft. Her thoracic epidural catheter at T8-9 level dosed with bupivacaine 0.125% and fentanyl 2 mcg/ml and an infusion rate at 6 ml/hour was started for post-operative pain control. She remained intubated, but was awake and able to answer questions by writing on paper the next morning. She was brought back to OR in the afternoon for completion of the repair of right hemidiaphragm, placement of two chest tubes, and closure of abdomen. There was minimum intraoperative bleeding. The patient was extubated at the end of the procedures and brought back to the ICU for recovery.

Post-operative course:

Her postoperative course was complicated by non-occlusive, bilateral deep venous thrombosis of the common femoral veins treated with a heparin infusion followed by subcutaneous enoxaparin injection. Renal function was minimally impacted considering the patient's history of previous unilateral nephrectomy and IVC cross-clamping with reconstruction. The patient's creatinine peaked at 1.37 mg/ and rapidly returned to a normal level (range 0.51-0.95 mg/dL) after fluid bolus. Her postoperative pain was well controlled by an epidural infusion and she was discharged from ICU on postoperative day (POD) 5 and returned home on POD#14.

**Discussion**

Because adrenocortical carcinoma is a rare neoplasm, there are no randomized controlled studies to guide treatment recommendations. Data from retrospective cohort studies provide the highest level of evidence available. Currently, the only curative treatment to ACCs remains aggressive

surgical resection. Adjuvant therapies aim to reduce the risk of recurrence. These tumors are usually highly invasive with 50-70% of the patients being already in advanced stage upon presentation [6-8]. Due to limited efficacy and associated toxicity with systemic chemotherapy for ACC, it is critical to appreciate the role of resection of locally advanced and recurrent or metastatic disease. Although cure is rarely achieved in these circumstances, resection may offer survival benefit as well as symptom relief in appropriately selected patients.

This patient had stage IV disease with metastases to the liver and the lungs. She also had recurrent retroperitoneal mass extending to IVC. Systemic chemotherapy after initial surgery provided good control of tumor progression. Due to her young age and without any other comorbidities, she was considered a good candidate for surgical resection to decrease her tumor burden.

The surgical approach to the adrenal mass depends greatly on the side and size of the tumor. Left-sided ACCs generally are adherent or invasive to the spleen, pancreas, left kidney, splenic flexure of the colon, and/or stomach and these organs may need to be resected at the time of operation. Post-operative complications of left-sided multivisceral resections include renal failure/insufficiency, pancreatic fistula, postsplenectomy sepsis, and/or delayed gastric emptying. Right-sided ACCs can invade the right kidney, liver and IVC. If the ACC invades the IVC (often along the right adrenal vein), a portion of the IVC along with tumor thrombus needs to be excised. This can require complete isolation of the retrohepatic IVC and/or cardiopulmonary bypass if there is an involvement of supradiaphragmatic thrombi. The main risk of resection of a right-sided ACC is massive life-threatening bleeding from injury to the IVC. Complications that are common to both left and right sides include adrenal insufficiency, hernia, deep venous thrombosis in addition to perioperative cardiovascular morbidity, such as myocardial infarction and pulmonary embolism.

A European Society of Endocrine Surgeons (ESES) survey from 18 centers in nine countries reported ACC with IVC invasion was encountered in 38 patients. Tumor thrombus extended in the prehepatic IVC (n=21), subdiaphragmatic IVC (n=6) or into the SVC/right atrium (n=3). Perioperative 30-day mortality was 13% due to severe intraoperative bleeding and postoperative coagulopathy[9]. Chiche L. et al reported ACC invaded adjacent and retroperitoneal organs in about 25% of cases. ACC can affect the IVC by compression, direct invasion or by intraluminal extension in the form of thrombus [1].

Perioperative evaluation of a patient with a tumor invading the IVC includes a comprehensive review of the preoperative imaging studies (CT or MRI, echocardiogram) to assess for tumor extension and structures affected. Ultimately, tumor extension will impact surgical planning and anesthetic management. Hepatic vein invasion may affect drug metabolism and coagulation. Increased collateral circulation will also potentiate the risk of intraoperative bleeding.

In this case, we encountered massive blood loss. Pre-operative anticipation and preparation, timely intraoperative recognition and efficient management are vital for successful outcomes after major blood loss. In an analysis of hemorrhage claims from Anesthesia Closed Claims Project database between 1995 and 2011, the authors note that anesthesia care was more often assessed as less than appropriate [10]. Anesthesiologists should, therefore, be well adept at the current concepts in the management of massive blood loss and transfusion.

Massive blood transfusion is a life-saving and life-threatening process. Bleeding leads to tissue hypoxia resulting in acidosis, blood transfusion and crystalloid infusion causing hypothermia, dilution of coagulation factors and platelets thereby leading to coagulopathy. Current evidence in the literature demonstrates that early administration of FFP, as in this case during massive transfusion, decreased coagulopathy and improved survival in patients. The utilization of an MTP can lead to improved patient physiologic stabilization and a decrease in mortality [11]. The main aim is to optimize cardiac output, tissue perfusion, oxygenation and metabolic state. The complications of massive blood transfusion include immunologic reactions, transfusion reactions, and metabolic complications (*e.g.* citrate toxicity, hyperkalemia, hypocalcemia, hypomagnesemia, and acidosis). To optimize management, complete blood count, coagulation profile, ionized calcium and ABG with electrolytes should be measured both early and frequently. Coagulation tests usually have long processing times and may not be helpful in guiding therapy in a rapid evolving bleeding scenario. Thromboelastography (TEG) has proven to be a simple viscoelastic test of overall coagulation by measuring clot strength, which reflects the quantity and quality of both clotting factors and platelet function. It is a rapid (several minutes versus 45 minutes for APTT and PT) test, and the results that can direct appropriate therapy in a timely and targeted manner. Goal of massive blood loss resuscitation are to maintain temperature >35°C, pH > 7.2, base excess < 6, lactate < 4 mmol/L, and ionized calcium > 1.1 mmol/L. Platelets count > 50 K/mcL, PT/activated partial thromboplastin time <1.5 × normal, with INR <1.5 and fibrinogen level > 1.0 gm/L [11].

In summary, ACC is an uncommon and aggressive tumor with the potential to invade local tissue including the IVC. Anesthetic management requires a comprehensive preoperative evaluation, understanding the characteristics of tumor extension and structures involvement, strong perioperative communication with surgeons, and preparation for complications, such as massive blood loss. The use of a massive transfusion protocol to facilitate timely and appropriate use of PRBC and other blood components may reduce the risk of mortality. A multi-disciplinary approach involved with endocrinology, cardiology, surgery, anesthesiology, transfusion medicine and intensive care is strongly recommended for these rare but complex cases.

## *References*


1. Varghese J., Habra MA., et al Update on adrenocortical carcinoma management and future directions. *Current Opin Endocrinol Diabetes Obes.* 2017; (24) 209-14
2. Dickson P., Kim L., et al. Evaluation, staging, and surgical management for Adrenocortical Carcinoma: An Update from the SSO Endocrine and Head and Neck Disease Site Working Group. *Ann Surg Oncol.* 2018; (25) 3460-3468
3. Schulick RD., Brennan MF, Long term survival after complete resection and repeat resection in patients with adrenocortical carcinoma. *Ann Surg Oncol.* 1999; (6) 719-26
4. Vaidya A., Nelis M., Kilbridge K., Treatment of Adrenocortical Carcinoma. *Surgical Pathology* 2019; (12) 997-1006M
5. Chiche L., Drousset B., et al Adrenocortical carcinoma extending into the inferior vena cava: Presentation of a 15-patient series and review of the literature. *Surgery* 2006; (139) 15-27
6. Rossella Libe Adrenocortical carcinoma (ACC): diagnosis, prognosis, and treatment. *Frontiers in cell and developmental biology* 2015; (3): Article 45
7. Fassnacht M, Johanssen S, et al Limited prognostic value of the 2004 International Union against cancer staging classification for adrenocortical carcinoma: proposal for a revised TNM classification. *Cancer* 2009; (115) 243-250

8. Fassnacht M, Dekkers OM, et al European Society of Endocrinology clinical practice guidelines on the management of adrenocortical carcinoma in adults, in collaboration with the European network for the study of Adrenal Tumors. *Eur J. Endocrinol* 2018; (179):G1-46
9. Mihai R, Iacobone M, et al Outcome of operation in patients with adrenocortical cancer invading the inferior vena cave – a European Society of Endocrine Surgeons (ESES) survey. *Langenbecks Arch Surg* 2012; (397):225-231
10. Dutton RP, Lee LA et al. Massive hemorrhage. A report from the anesthesia closed claims project. *Anesthesiology* 2014; (121):450-8
11. Practice guidelines for perioperative blood management an updated report by the American Society of anesthesiologist's task force on perioperative blood management. *Anesthesiology* 2015; (122):241-275
12. Patil V and Shetmahajan M. Massive transfusion and massive transfusion protocol. *Indian J. Anaesth* 2014; (58):590-595

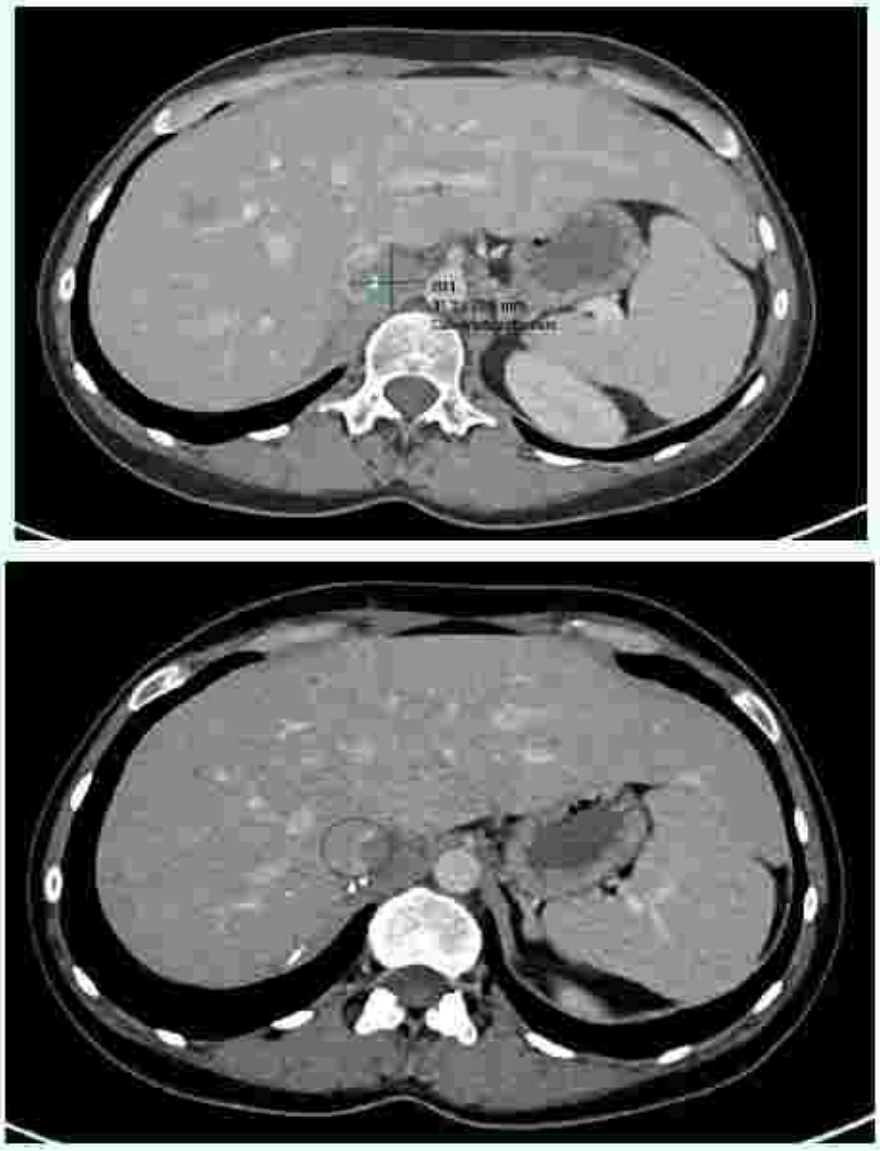


**Fig 1. A**. CT scan with contrast injection showed right adrenal gland is surgically absent. Soft tissue mass in the surgical bed measures (3.1cm x 2.9 cm). **B.** This mass results in complete

effacement of the adjacent IVC

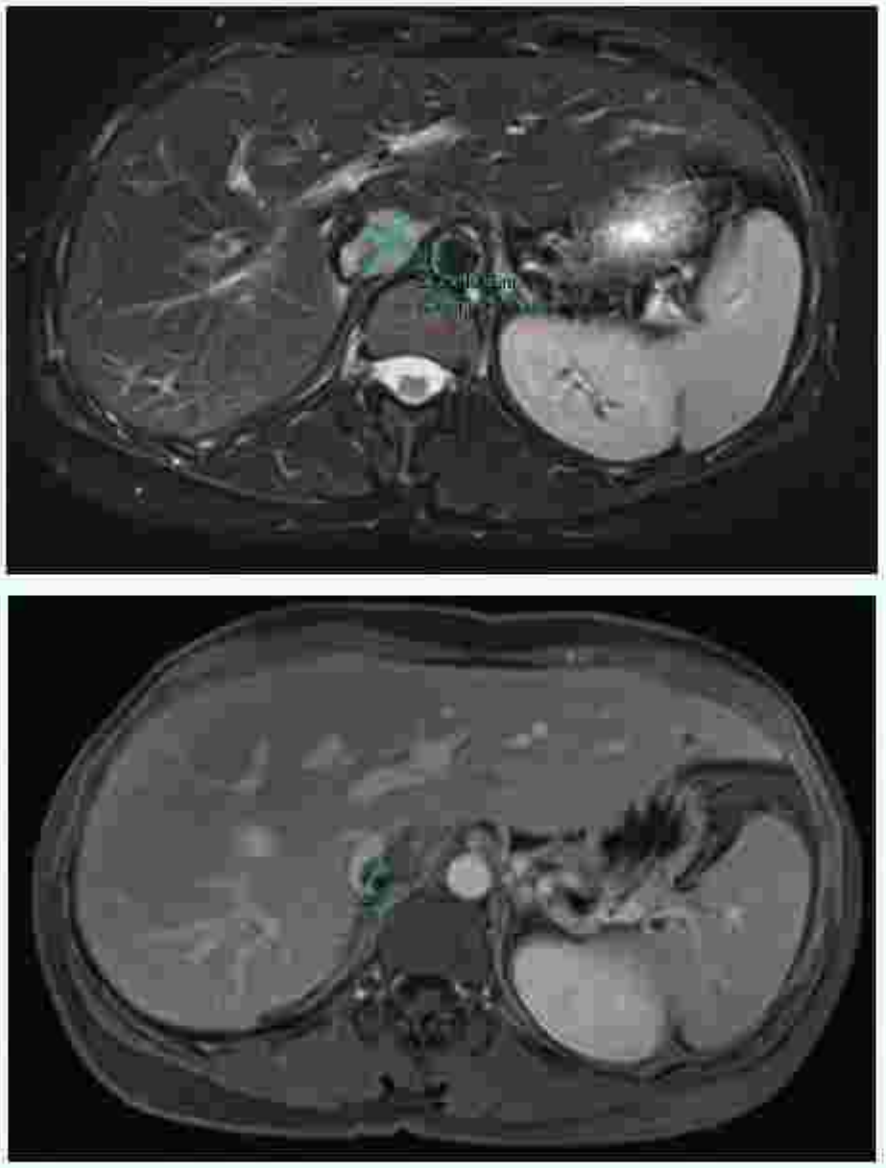


**Fig 2. A.** MRI demonstrating the presence of T2 hyperintense and diffusion-restricting lesion at right adrenalectomy surgical bed with highly likely extension to the IVC (2.6cm x 1.8 cm). **B.** Non-enhancing component of this lesion in the IVC (1.1cm) suggesting a bland thrombus

# Inability to visualize the endotracheal tube for an intubated patient in ICU -Emergency airway management

Ning Miao, MD
Xiaowei Lu, MD
Andrew Mannes, MD, Chief
DPM, CC NIH

**Abstract**

Emergency intubation or endotracheal tube (ETT) exchange for patients in ICU, due to patient's respiratory failure, air leak or ETT dislodge, present a risk of loss of the airway with subsequent cardiac or respiratory arrest, especially in patients with difficult airway who have been prolonged intubation, thick secretion or edematous soft tissue (e.g. swollen tongue). We present an emergent ETT exchange for an adult SARS-CoV-2 patient in ICU whose respiratory function was deteriorating due to a persistent cuff leak.

**Introduction**

Airway emergencies (AEs) are life-threatening events that can happen at any time in the hospital, most commonly in ER and ICU. AEs involve the risks for many potential complications that can increase the patient's morbidity or result in death. When AEs develop, critical actions are time sensitive and rapid responses are required. The healthcare providers in this situation must be capable of rapidly assessing the patient but also of simultaneously implementing appropriate interventions[1,2]. The goal of AEs management is to rapidly optimize oxygenation and ventilation while minimizing the risk of complications such as aspiration.

The difficult airway (DA) represents a complex interaction between patient factors, the clinical setting, and the skills of the practitioner, and sometimes can quickly become emergencies, increasing the risk of life-threatening complications or death[3,4]. There are two separate scenarios for considering the difficult airway. The first is difficult mask ventilation (DMV) and the second, difficult tracheal intubation (DTI)[3,4].

The patients with prolonged intubation and/or frequent change of supine vs prone position to improve oxygenation will face higher risk of ETT migration or dislodge[5,6]. Therefore, successful prevention of AEs depends on rapid recognition and intervention before patients become unstable. It is also paramount that clinician is able to troubleshoot the difficult airway with available appropriate equipment[2,3].

Recently, the aerosol spread of the SARS-CoV-2 virus during airway management procedures have added the complexity of the task, and medical providers have to wear special personal protective equipment (PPE). The use of PPE impacts clinicians by reducing mobility,

dexterity and audibility, and makes it more difficult to communicate with other medical providers. This is especially critical with emergency laryngeal manipulation, endotracheal intubation, ETT exchange etc[10]. We present a prolonged intubated adult with severe SARS-CoV-2 acute respiratory distress syndrome (ARDS) and significant air leak. The patient had an undisclosed difficult airway with respiratory complications after failure to advance or exchange ETT by the anesthesiologist as a result of non-visualize ETT and vocal cord.

**A case report**

71-year-old male with BMI 40.1 kg/m$^2$, COPD/Asthma, obstructive sleep apnea, hypertension and dyslipidemia who has been intubated due to severe SARS-CoV-2 ARDS requiring mechanical ventilation in ICU for more than 7 days. Since admission to ICU, ventilation settings were monitored and adjusted based on his respiratory status, ABG results and oxygen saturation. He was sedated, and he cycled through the supine and prone positions intermittently to optimize oxygen saturation. He was also treated with IV fluid, Remdesivir / dexamethasone, bronchodilator as needed, empiric antibiotics, vasoactive medication for hypotensive shock, Continuous Renal Replacement Therapy (CRRT) for oliguric acute renal failure and worsening volume overload.

A series of AP CXR showed ETT positions had migrated every day. The first day when he was admitted to the ICU, CXR showed ETT 2.6cm cephalad to the carina, and then 2.9cm, 3.5cm, 4.5cm, 5.7cm and 6cm away from carina daily changes till ETT was not visualized on the AP CXR.

When the ETT was found to have a significant air leak which didn't improve after cuff deflation and re-inflation during an unsuccessful attempt to advance the ETT by ICU providers, the anesthesiologist on duty was called into SARS-CoV-2 ICU for urgent exchange of ETT at bedside. The responder was unaware of the patient airway status and previous attempts to advance ETT. The anesthesiologist donned the PPE and entered the room to inspect the ETT with a video glide-scope. Initially, the ETT could not be visualized because it was obstructed by the swollen tongue and an overinflated ETT balloon in the upper airway above the vocal cord. Upon closer examination, the anesthesiologist found the ETT curled toward the left site in the mouth and covered by edematous soft tissue and tongue (Fig 1-3). The anesthesiologist assisted by the respiratory therapist, released ETT securement device (ETT holders) at patient's lip, tried to mobilize the ETT back to the midline and to possibly advance the ETT between the vocal cords. Immediately, the patient developed a leak and could no longer be adequately ventilated. The mechanical ventilator could not deliver sustainable tidal volume, desaturation occurred quickly after a few minutes. The patient progressed to hypoxic bradycardic arrest. CPR was initiated immediately. After several further attempts, the anesthesiologist was able to re-intubate the patient blindly with a direct laryngoscope and secured the airway. The spontaneous circulation (ROSC) returned after three rounds of epinephrine, calcium gluconate, and sodium bicarbonate.

The patient was initiated on inhaled nitric oxide, continued on CRRT while on bicarbonate drip and vasopressors. Over the next 24 hours, vasopressors and bicarbonate drip were weaned off. TTE post cardiac arrest showed normal left ventricular function. Family was updated and it was decided that no further heroic measures would be continued should he have a cardiac arrest. A sedation and paralytics weaning trial was planned for the next day to assess neurological status, but later that evening, the patient's blood pressure deteriorated and within minutes, the patient was found to be in asystole.

**Discussion**

Adverse airway events are often unpredictable, urgent and life-threatening which most commonly happen outside operating rooms (ORs). They have high risks of difficult intubation, airway injury and other complications, even among highly trained and skilled anesthesiologists[11]. Major risk factors which result in AEs can be described as obstructed airway, traumatized airway, and failure of invasive airway procedures or ventilation[3].

Loss of an airway in an intubated patient, whether spontaneous or accidental extubation/dislodgement, is a medical and surgical emergency. All those factors could be related to the difficult airway either difficult face mask ventilation, or difficult laryngoscopy and /or intubation. A difficult face mask ventilation means the clinician is unable to provide adequate tidal volume due to excess gas leak of face mask. A difficult laryngoscopy refers to non-visualization of any part of the vocal cord with a direct laryngoscope. A difficult intubation implies requirement of multiple intubation attempts. A failed intubation signifies that a clinician fails to secure the airway even with multiple intubation attempts[3-4,11] (Table 1).

In our case, the patient's age, morbid obesity, comorbidities, ARS-CoV-2 ARDS respiratory failure, swelling tongue and prolonged intubation all strongly indicated he was a critical ill patient with a potential difficult airway. If ETT dislodged from the trachea, reintubation might be very difficult under urgent situations. With video glide-scope inspecting change[7-8], the airway and ETT position, the anesthesiologist was unable to visualize the ETT, only swollen tongue and an overinflated ETT balloon visible above the vocal cord in the beginning. Although the anesthesiologist was cautious to explore the ETT, the attempts to mobilize the dislodged ETT resulted in a pronounced leak that progressed to hypoxic bradycardic arrest. Ultimately, the anesthesiologist established the airway during the administration of ACLS and the patient had ROSC but subsequently died.

From this case, we acknowledged the importance of rapid and clear communication between the anesthesiologist and patient's clinician regarding details about the patient's major comorbidities, airway status, ETT migration, focusing on the possible difficult airway and dislodge ETT position prior to airway management. As in these acutely ill patients in emergent need of care, airway management leaves little margin for error. To prevent similar situations, there is a need for rapid awareness of emergency equipment on hand and for a clear strategy for difficult airway management together with contingency plans.

One of the most critical assessments of ETT placement is conforming the appropriate depth in the trachea after intubation. Too deep causes bronchial ventilation and atelectasis of contralateral lung, too shallow might lead to unanticipated extubation. The usual common sense is that appropriate ETT placement was defined as a tip greater than 2-5cm above the carina and cuff placement at least 2cm past the vocal cord[8,11]. The evidence showed accidently extubation from the airway often occurred during the change in patient position, or tracheal tube manipulation and fixation[14-15]. After the supine to prone position change, 91.7% of patients had ETT tube displacement and of these, 48% of patient's ETT moved ≥ 10 mm. position change displaced the ETT and ETT displacement caused cuff pressure head and neck extension leads to ETT cephalad withdrawal, where flexion leads to caudal ETT movement about 2.8cm and 2.7cm respectively[7,8,14-15]. Accordingly, tongue swollen in an already intubated patient can cause ETT cephalad migration and may result in accident extubation. With in situ ETT proximally fixed by the ETT holder at the lip, tongue swelling causes the ETT to take a greater radius of curvature in the oropharynx, causing the ETT to back out of the trachea and cephalad migration[14].

The causes of cuff leaks can be classified as leaks from the defective cuff, or leaks around an intact cuff which are caused by cuff under inflation, cephalad migration of ETT, tracheal displacement of oro/nasogastric tubes, discrepancy between ETT and tracheal diameter, and high peak airway pressure. The ETT position should be checked by direct inspection when the balloon is suspected to be above the vocal cord, or CXR when the balloon is suspected to be below the vocal cord. If the cuff is intact, ETT may only need adjustment and does not have to be replaced with a new tube[13].

Exchanging an ETT due to tube malfunction is often needed in an urgent situation for a patient who has reduced cardiopulmonary reserves. These procedures are not trivial techniques and could lead to esophageal intubation, loss of the airway, severe hypoxia, or cardiac arrest, especially in patients with difficult airways. Before moving forward with ETT exchange, anesthesiologists should determine why the ETT is not functioning correctly (e.g. cuff perforation, ETT kink, dislodged or unmatched size)? Based on the assessment, the anesthesiologist should prepare necessary personnel and instruments for possible lost airway[13,17-18]. If time permits, the anesthesiologist should visualize the vocal cord and ETT with laryngoscopy before proceeding with ETT exchange.

In our case, the patient ETT migrated gradually from 2.6 cm above carina towards cephalad direction until non-visualized under image. The anesthesiologist should keep in mind that the prolonged history of in situ intubation, change in body position from supine-to-prone or vice versa, head/neck flexion and extension, and ETT cuff pressure increase or decrease with body postural changes, the oral soft tissue and tongue swollen all prove high risk of ETT migration or dislodgement from the tracheal. If rushed to manage the patient's airway without assessing these risk factors and without appropriate preparation, the situation of a difficult airway could become a life-threatening emergency.

Since early in 2020, SARS-CoV-2 disease has been spreading through global pandemics and caused the deaths of hundreds of thousands of people from severe respiratory, cardiac or multiorgan failure[19]. The World Health organization (WHO) documented that among almost all patients who suffered SARS-CoV-2 infection, about 14% of cases are severe, possibly requiring treatment of oxygen in a hospital. About 5% of people had critical infections and required ventilator support. While any age group can get COVID-19 pneumonia, it's more likely in people who are 65 or older. Those who are 85 or older are at the highest risk. Patients with a weakened immune system may also be more likely to get severe COVID-19 illness. This includes patients who are tobacco users, patients undergoing treatment for cancer, have had a bone marrow transplant, diagnosed with HIV or AIDS and patients taking immunosuppressive medications (e.g. steroids)[20-21].

In patients with severe SARS-CoV-2 disease, there is a high risk of aerosol spread of the virus during airway management procedures. To avoid such spread, the clinicians have to wear powered air-purifying respirators (PAPR) or Controlled Air-Purifying Respirator (CAPR) for enhanced respiratory protection when managing the patient's airway. However, it has been noted that clinicians felt poor audibility, mobility, dexterity and communication difficulties due to increased weight of the equipment and noise generated by positive airflow[18]. In this case, the anesthesiologist was called to ICU for urgently re-securing the airway, and was unable to communicate with ICU clinician or evaluate patient imaging prior to entering the SARS-CoV-2 ICU. With limited equipment and medical personnel for airway management inside the room, wearing CAPR significantly reduced communicating with other clinicians and delayed the time to ask for help or get help.

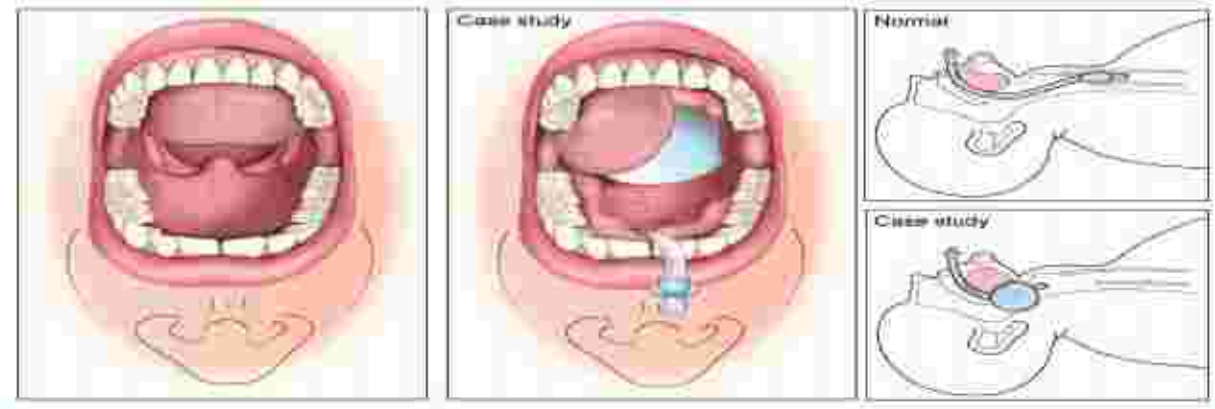
What we have learned from this case is that 1. At least two anesthesiologists should be present for SARS-CoV-2 ICU patient airway management. 2. Thorough communication with ICU clinician of patient history and physical exam, especially focused on airway, ventilation, oxygen saturation status and other comorbidities. 3. Anesthesiologists should verify the various airway plans before to entering the room and contacting the patients (if practical). 4. Appropriate equipment should be easily available for difficult airways. 5. Roles of team members and closed-loop communication should be described. 6. Critical airway response team might be needed to manage AEs and difficult airways in the hospital.

**Conclusion**

Performing emergent intubations or ETT exchanges in unfamiliar locations increases the complexity and creates a higher incidence of difficult intubations and complications which can cause life-threatening airway emergencies. Prior to urgently managing the patient airway, the anesthesiologists should acknowledge that those patients are commonly at high risk and functionally compromised, and be aware of the barriers to safe airway management in remote locations. It is critical to communicate with patient care doctors, understand patient respiratory status, major comorbidities, be familiar with equipments and have quick access to airway

devices, tools, and medications, even more so to manage SARS-CoV2 patient with advanced PPE (PAPR or CAPR).

Fig. 1. Schematic diagram of endotracheal tube (ETT) in the oropharynx




A. Normal oropharynx B. curled ETT and huge balloon C. Side view of ETT position

Table 1. The risk factors of difficult airway

| Difficult mask ventilation (DMV) | Difficult tracheal intubation (DTI) |
|---|---|
| Obesity | Limitation of Mouth opening |
| Beard | Mallampati class 3 or 4 |
| Elderly (>55 years) | Restrict heads/neck movement |
| Snores | Thyromental distance decrease |
| Edentulous | Submandibular space short |

## References

1. Damrose, J. E. The critical response team in airway emergencies. *The Permanente journal*. 2019, 23: 18-219.
2. Wisborg, S. J.-O. Emergency airway management – by whom and how? *Acta Anaesthesiologica Scandinavica* 2016, 60: 1185–1187.
3. Raveendra US, A. G. Coping with airway emergencies: Get, Set, Go! *Indian journal of anaesthesia*. 2020, 64; (15):168-174.
4. Lynette J. Mark, M. K. Difficult Airway Response Team: A Novel Quality. *Anesth*. 2015, 121:127–39.
5. John G Orfanos, D. M. Causes of the Difficult Airway. *Atlas Oral Maxillofacial Surg Clin N Am*. 2010, 18; (1): 1-9.
6. Jeffrey L. Apfelbaum, C. A. Practice Guidelines for Management of the Difficult Airway: An Updated Report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology 2013*, 118:251–270.
7. Toshiyuki Minonishi 1, H. K. The supine-to-prone position change induces modification of endotracheal tube cuff pressure accompanied by tube displacement. *J. Clin Anesth. 2013*, 25(1):28-31.

8. Robert Tailleur 1, I. B. Endotracheal tube displacement during head and neck movements. Observational clinical trial. *Observational Study. 2016*, 32.54-58.
9. Herway ST, B. J. The tracheal accordion and the position of the endotracheal tube. *Anaesth Intensive Care. 2017*, 45, (2):177-188.
10. Ana Licinal, A. S. Use of powered air-purifying respirator. *Licina et al. Systematic Reviews. 2020*, 9:173.
11. Sollid SJM, M.-O. J. Emergency airway management- by whom and how? *Acta Anaesthesiologica Scandinavica. 2016-10*, 60 (9): 1185-1187.
12. Crawley SM, D. A. Predicting the difficult airway. *Continuing education in anaesthesia, critical care& pain. 2014*, 1-6.
13. Hyzy, R. C. Complications of the endotracheal tube following initial placement: Prevention and management in adult intensive care unit patients. *UpToDate. 2021*, 1-36.
14. Alberto Lucchini 1, S. B. Unplanned extubations in general intensive care unit: A nine-year retrospective analysis. *Acta Biomed. 2018*, 7; 89(7-S): 25-31.
15. Altye Okgun Alcan 1, M. Y. Effect of patient position on endotracheal cuff pressure in mechanically ventilated critically ill patients. *Australian Critical Care. 2017*, 30(5):267-272.
16. Stratmann G, B. J. Near tracheal extubation because of edema of the face endtongue. *Anesth Analg. 2002*, 95: 1809-1811.
17. Stender, S. Exchanging Endotracheal Tubes in Adults outside the Operating Room. *Anesthesia experts*. 2018.
18. Mort, T. C. ETT Exchange in the ICU. *Anesthesia Experts*. 2018.
19. Yao w, w. T. Emergency tracheal intubation in 202 patients with covid-19 in Wuhan, China: lessons and international expert recommendations. *British J. Anaesthesia. 2020*, 125 (1): e28-37.
20. John R. Greenland, M. D. COVID-19 Infection: Implications for Perioperative and Critical Care Physicians. *Anesthesiology. 2020*, 132(6):1346-1361.
21. Dudaryk, J. R.-B. Management of Respiratory Distress. *Dudaryk BMC Anesthesiology. 2020*, 20 (1):177.

跨学科知识讲座

# Trans-catheter Mitral Valve Repair - the Basics

Pinging Song, MD
Assistant Professor
Department of Anesthesiology and Pain Medicine
University of Washington, Seattle, WA

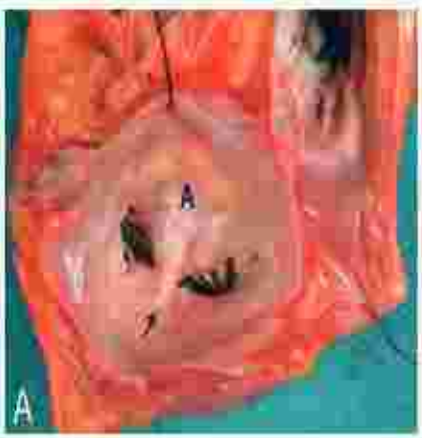
**Outline**

1. **Evolution and clinical application of the**
2. **MitraClip TM device**
3. **Preprocedural MV assessment for suitability**
4. **Step-by-step procedural guidance by TEE**

## Percutaneous Edge to Edge Mitral Valve Repair using MitraClip TM Device

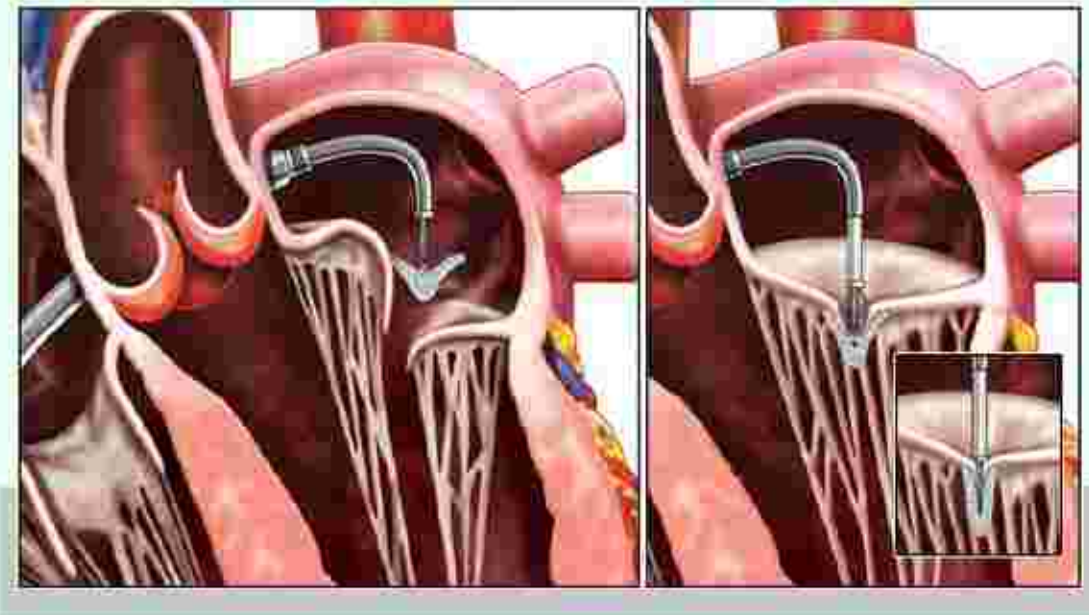
**Concept: create a double orifice "Alfieri stitch" via percutaneous catheter approach**


Alfieri stitch

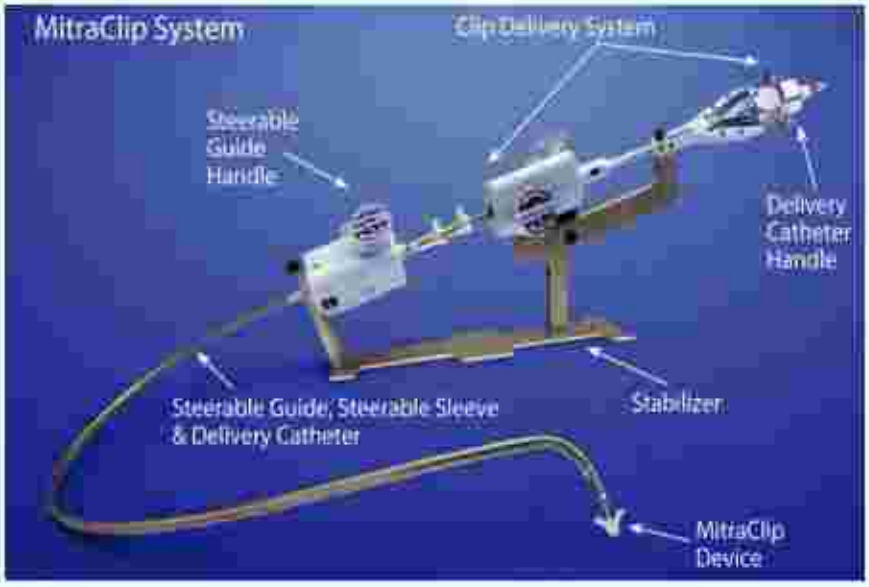



MitraClipTM

## Evolution of the MitraClip Device



| 2003 | 2008 | 2011 | 2013 | 2018 | 2019 |
|---|---|---|---|---|---|
| First case | CE Mark | Everest II Trial | FDA approval for Primary MR with prohibitive surgical risk (STS ≥ 6%) | COAPT trial | FDA approval for secondary MR |

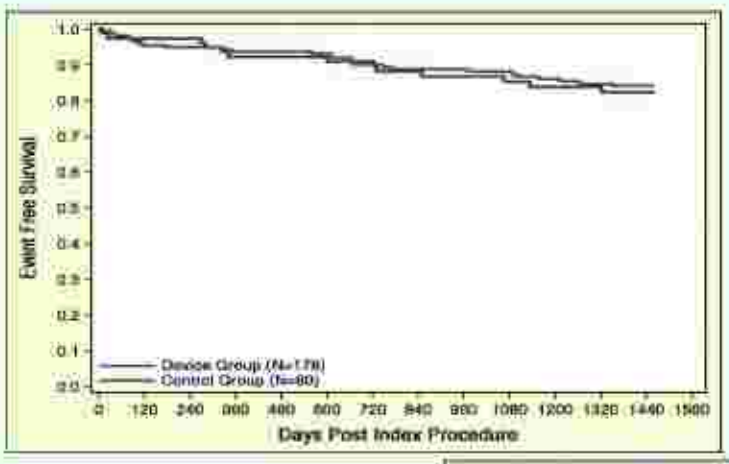



**2003: First MitraClip. Deployed by Dr. Jose Condado in Venezuela**

## Evolution of the MitraClip Device

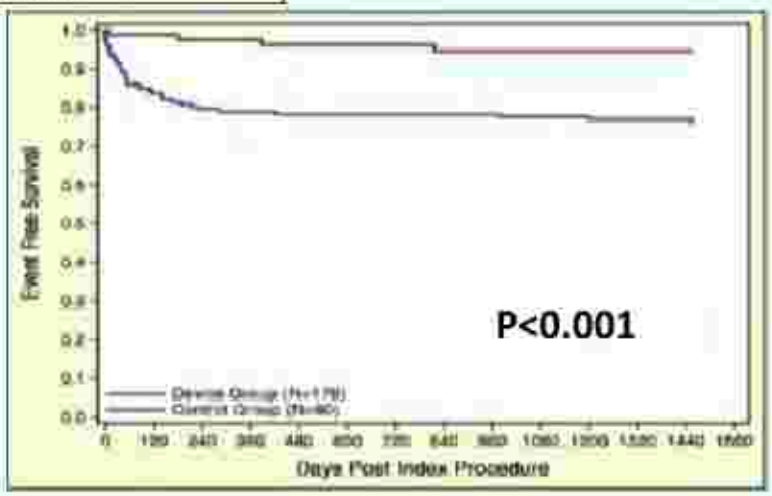
**MitraClip was safer than surgery (less major adverse events) in 30 days, but less effective in MR reduction at one year.**

### EVEREST II - Primary Mitral Regurgitation (MR)




**MitraClip group has no difference in overall survival, but more frequently required surgery at 1 year and 4 year for residual MR.**

Mauri L, et al.
JAm Coll Card. 2013



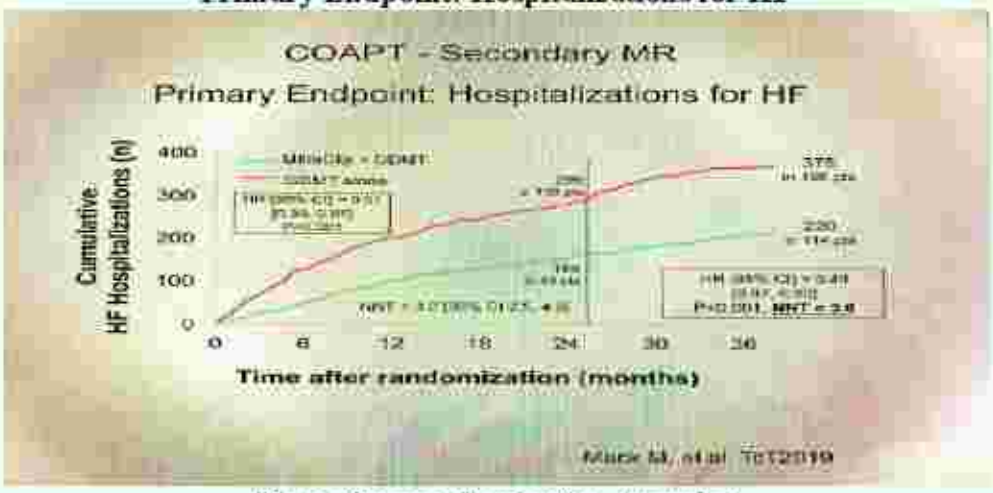

### FDA Approval of MitraClip in 2013

"The MitraClip Clip Delivery System is indicated for the percutaneous reduction of significant symptomatic mitral regurgitation (MR ≥ 3+) due to primary abnormality of the mitral apparatus [degenerative MR] in patients who have been determined to be at prohibitive risk for mitral valve surgery by a heart team, which includes a cardiac surgeon and a cardiologist, and in whom existing comorbidities would not preclude the expected benefit from reduction of the mitral regurgitation."

**Evolution of the MitraClip Device**

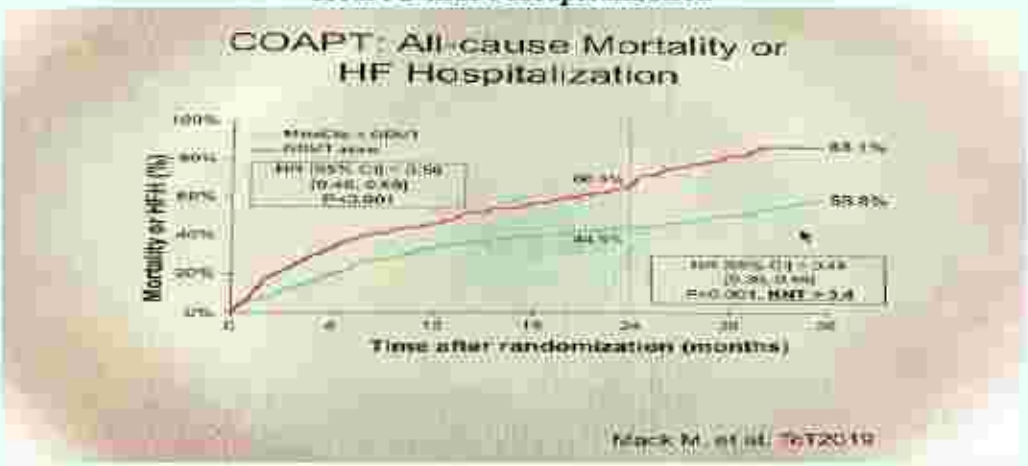
2018: COAFT trial – secondary or functional MR

**COAPT - Secondary MR**
**Primary Endpoint: Hospitalizations for HF**




**Time after randomization (months)**

**COAPT: All-cause Mortality or Heart Failure Hospitalization**




**Time after randomization (months)**

*GDMT: Guideline-directed medical therapy

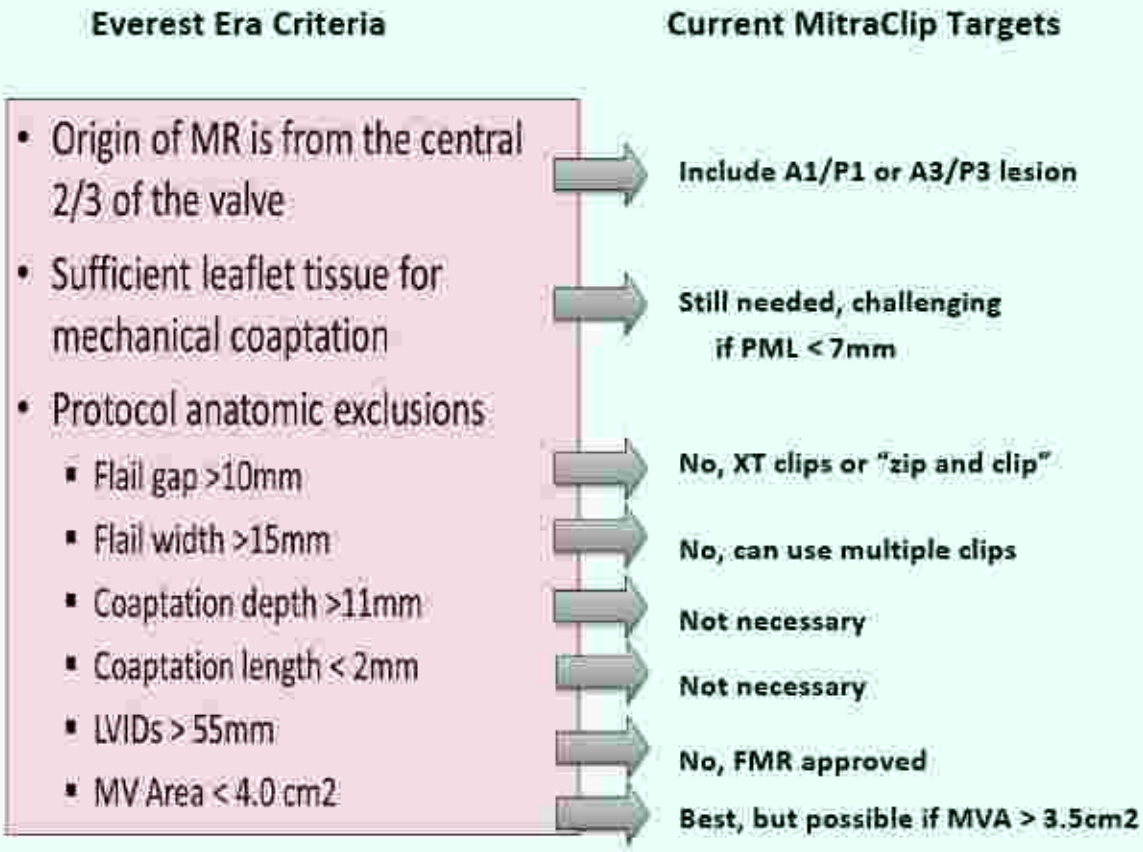
*COAPT: Multicenter, randomized, controlled, parallel-group, open-label trial of trans-catheter mitral-valve repair with the MitraClip device in symptomatic patients with heart failure and moderate-to-severe or severe mitral regurgitation.

**2019: FDA approval for secondary (functional) MR who have failed optimal GDMT**

**Pre-procedural Planning**

- Patient selection
  - Primary mitral regurgitation: heart team evaluation for surgical risk,
  - Secondary mitral regurgitation: failed optimal GDMT
- TTE/TEE: MR Mechanism and suitability for MitraClip
- Mitral Valve Anatomic Eligibility: broader inclusion criteria than the EVEREST era

**Mitral Valve Anatomic Eligibility**




**Decision for MitraClip**

1. How many clips?
2. What type of clips: NT/NTW, XT/XTW
3. Where to place the initial clip?
4. Concern of mitral stenosis

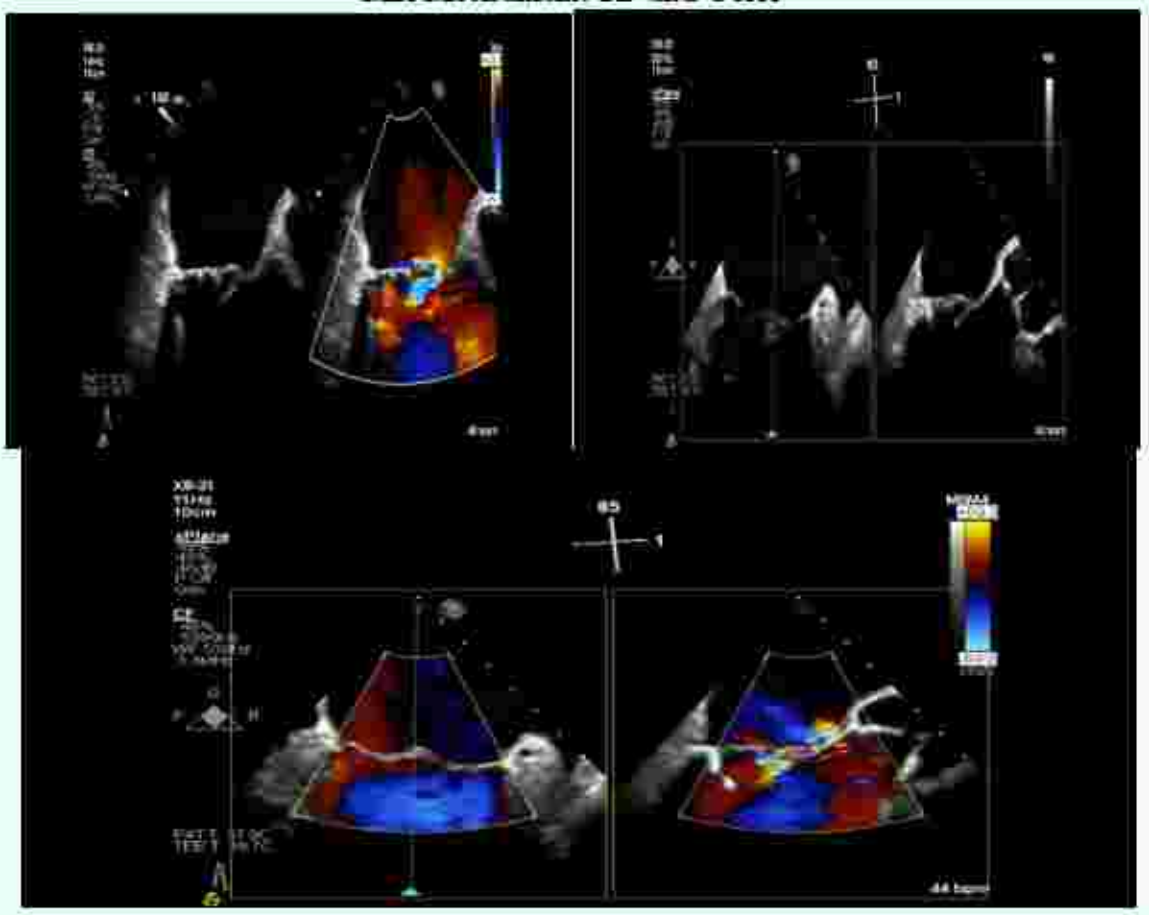
**Case Example Severe Primary MR**

- 80 year old male with severe MR. New York Heart Association (NYHA) class III symptoms. Preserved biventricular function, moderate pulmonary hypertension. Transient ischemic attack
- TTE. Mitral valve prolapse with flail. Large left atrium indication chronic MR
- Heart team (cardiology and cardiac surgeon) deemed high risk for surgery and appropriate for MitraClip.

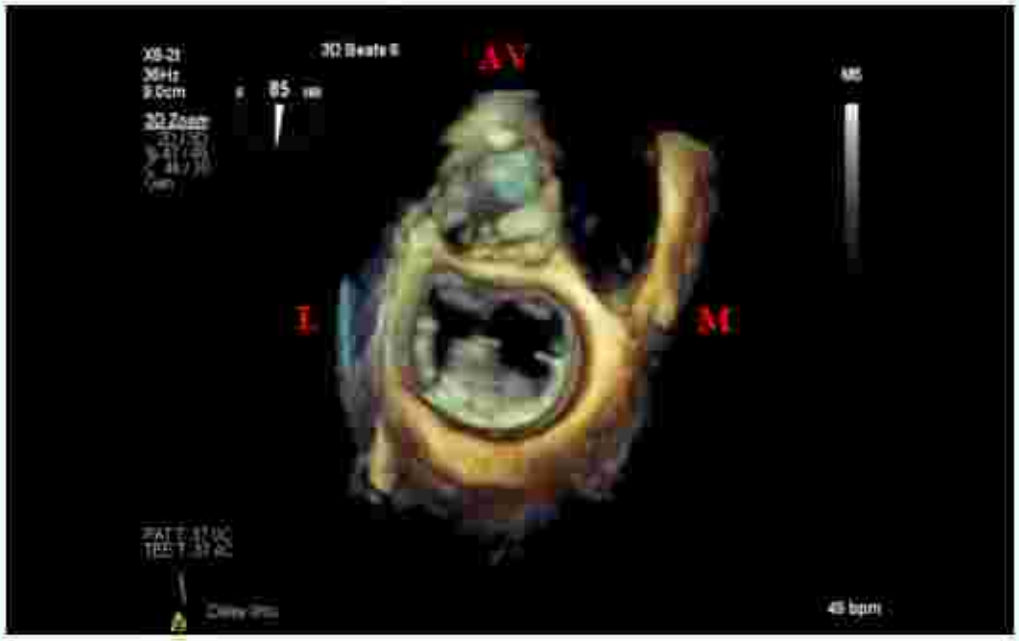
**Preprocedural Assessment: the Basics**

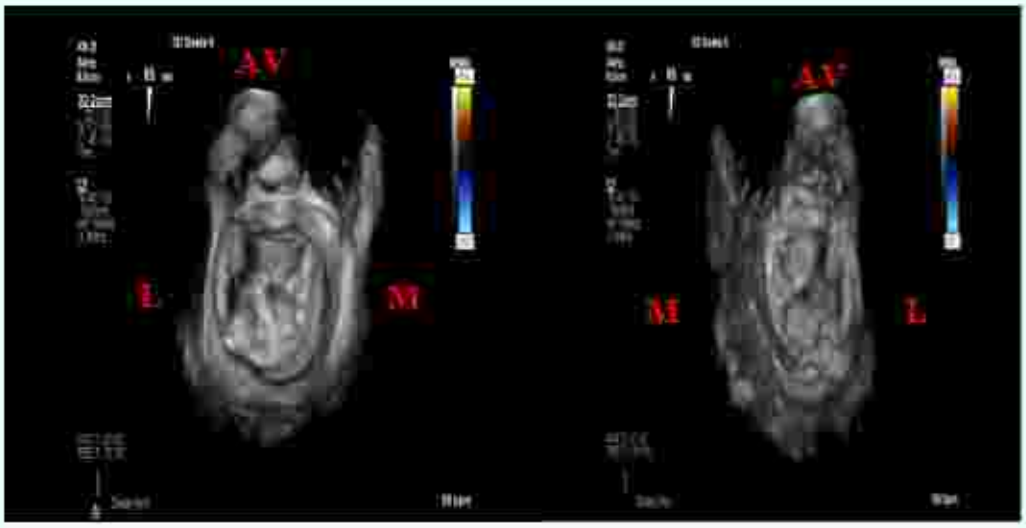
- Rule out clot of left atrial appendage (LAA)
- Coexisting valvular disease (Aortic stenosis or Tricuspid regurgitation)
- Pericardial/pleural effusion
- Interatrial septum (IAS). Patent foramen ovale (PFO)/ atrial septal defect (ASD)

**MR Mechanism: 2D and Color**

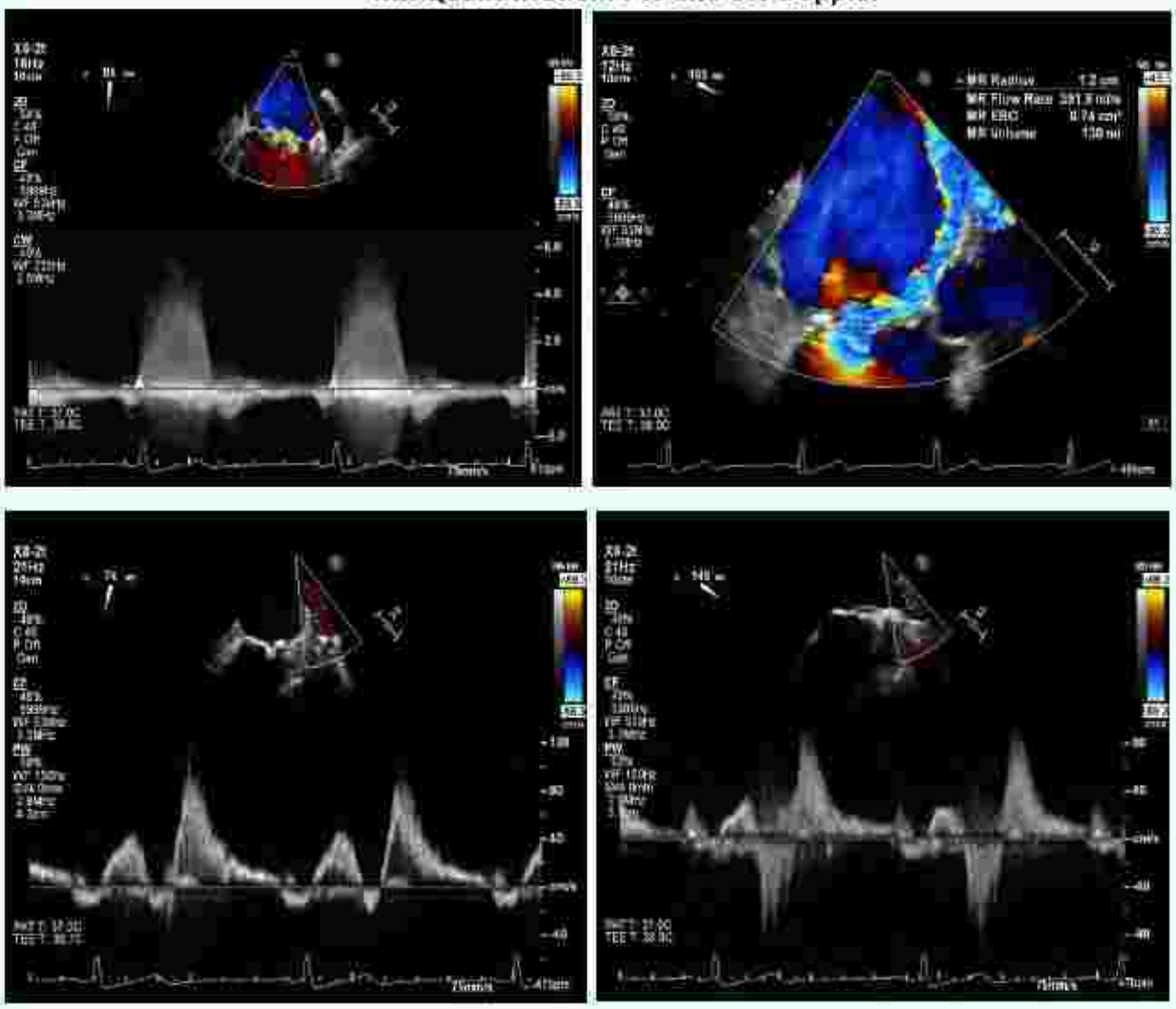


**MR Mechanism: 3D and Color**
**Mitral valve en face view: AV at 12 o'clock**


AV
L
M


AV
L
M
AV
M
L

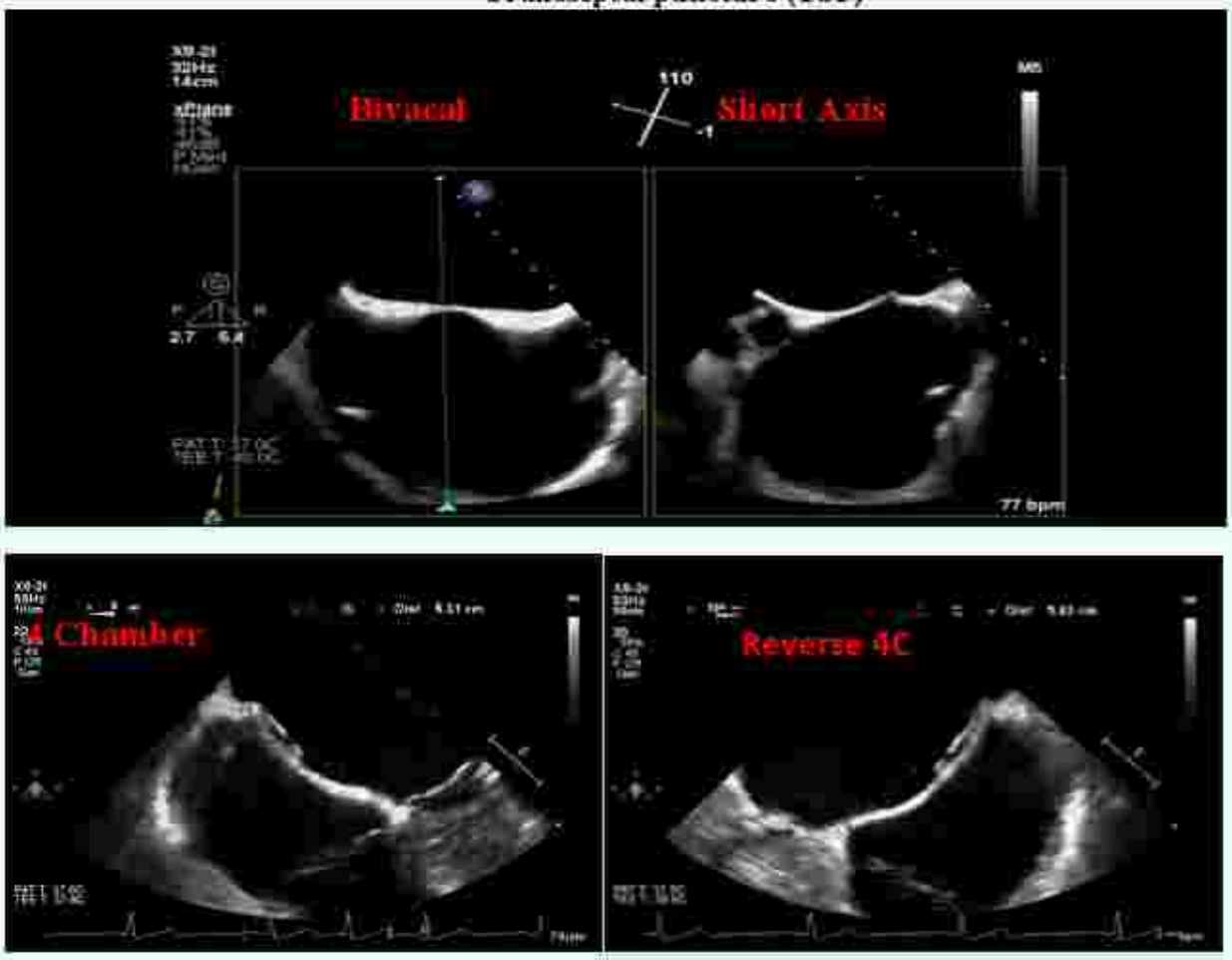
**MR Quantification: PW and CW Doppler**



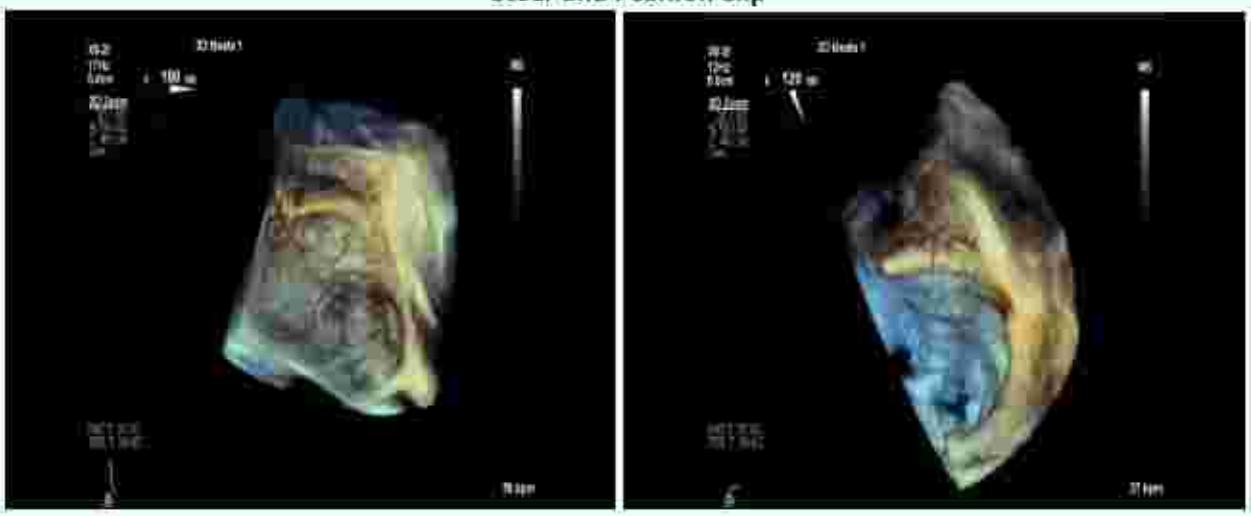
## Procedural Steps

- Transseptal puncture (TSP)
- Advancing SGC (steerable guide catheter) into LA
- Inserting and advancing CDS (clip delivery system)
- Steering and Positioning the clip above grasping area
- Advancing clip into LV and Grasping leaflets
- Comprehensive valve assessment
- Releasing clip

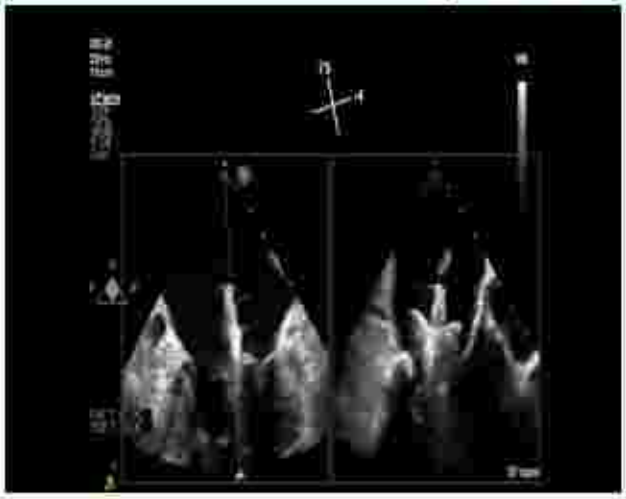
**Transseptal puncture (TSP)**



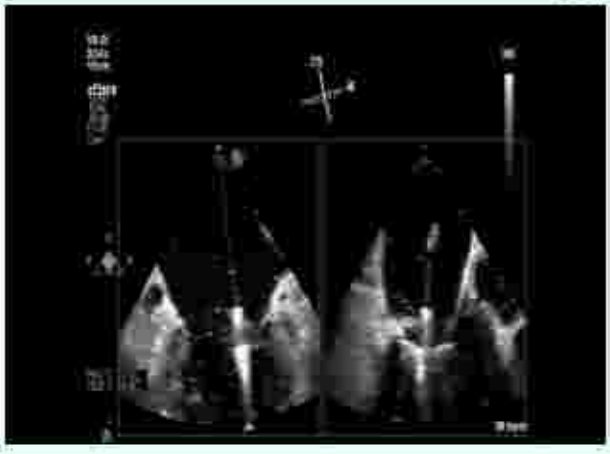

**Steer and Position Clip**

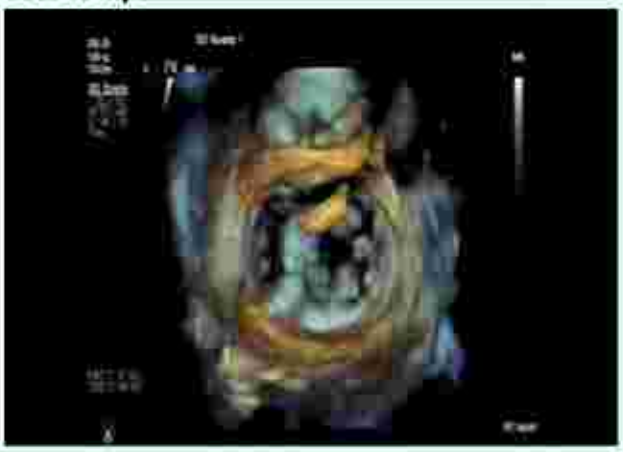


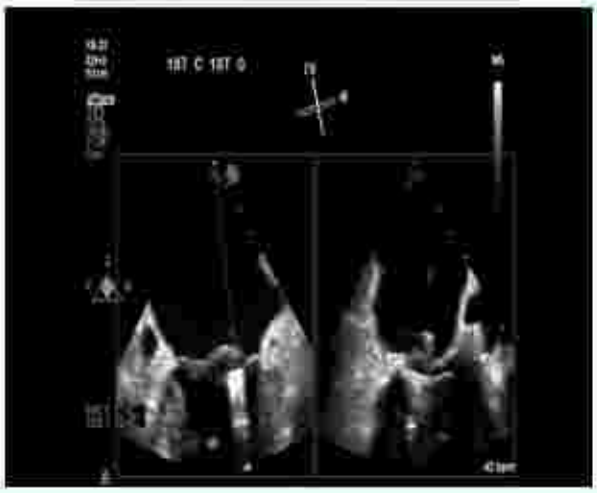
## Clip Position and Orientation

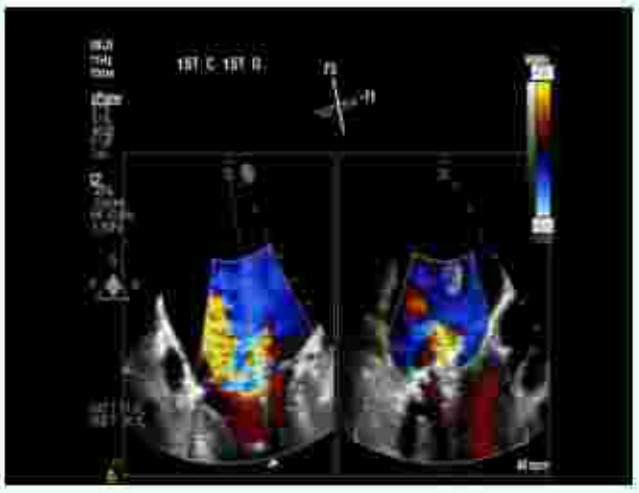


## Leaflet Grasp

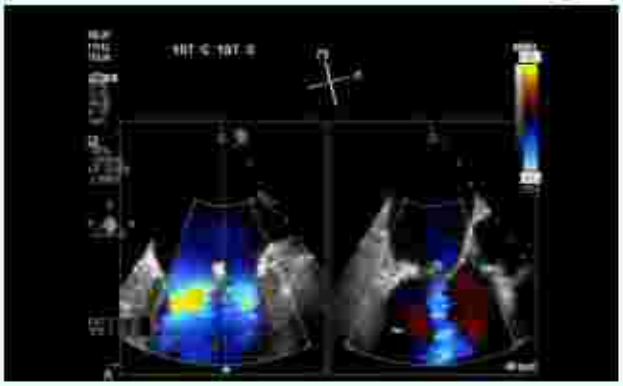


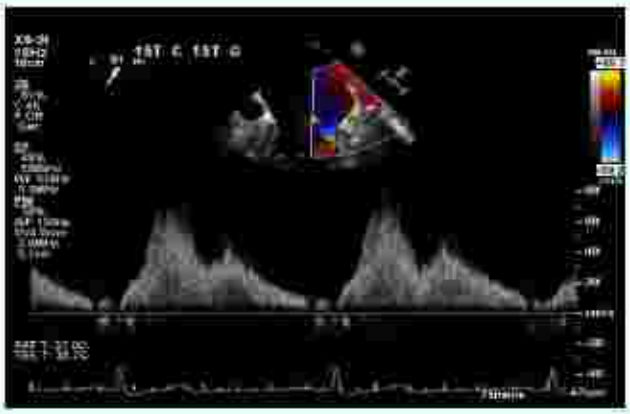


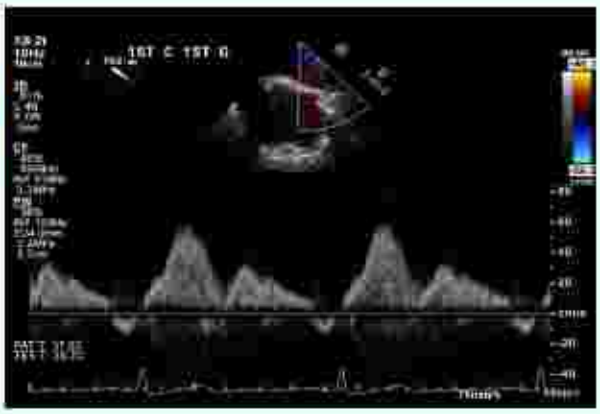




## Post-grasp Assessment





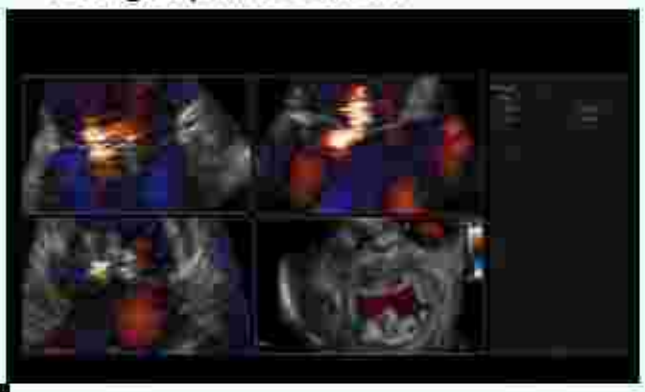


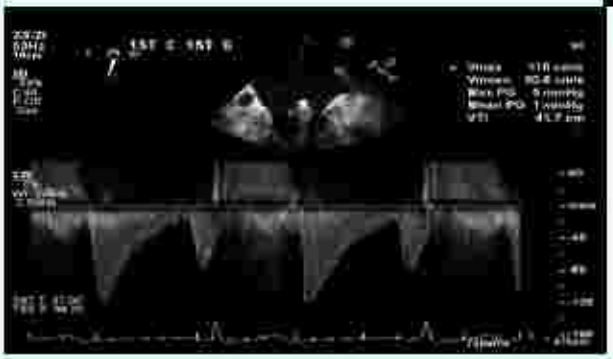
## Post-grasp Assessment

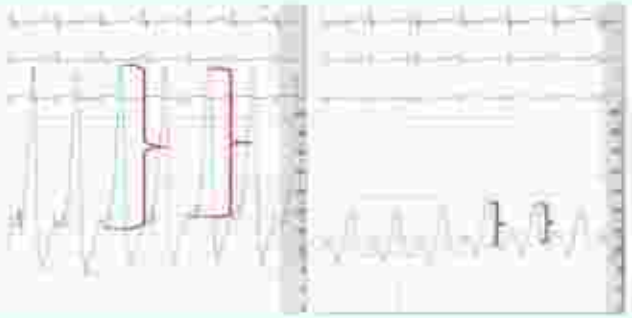
**Depending on residual MR severity and MV area:**

**Adjust and regrasp**

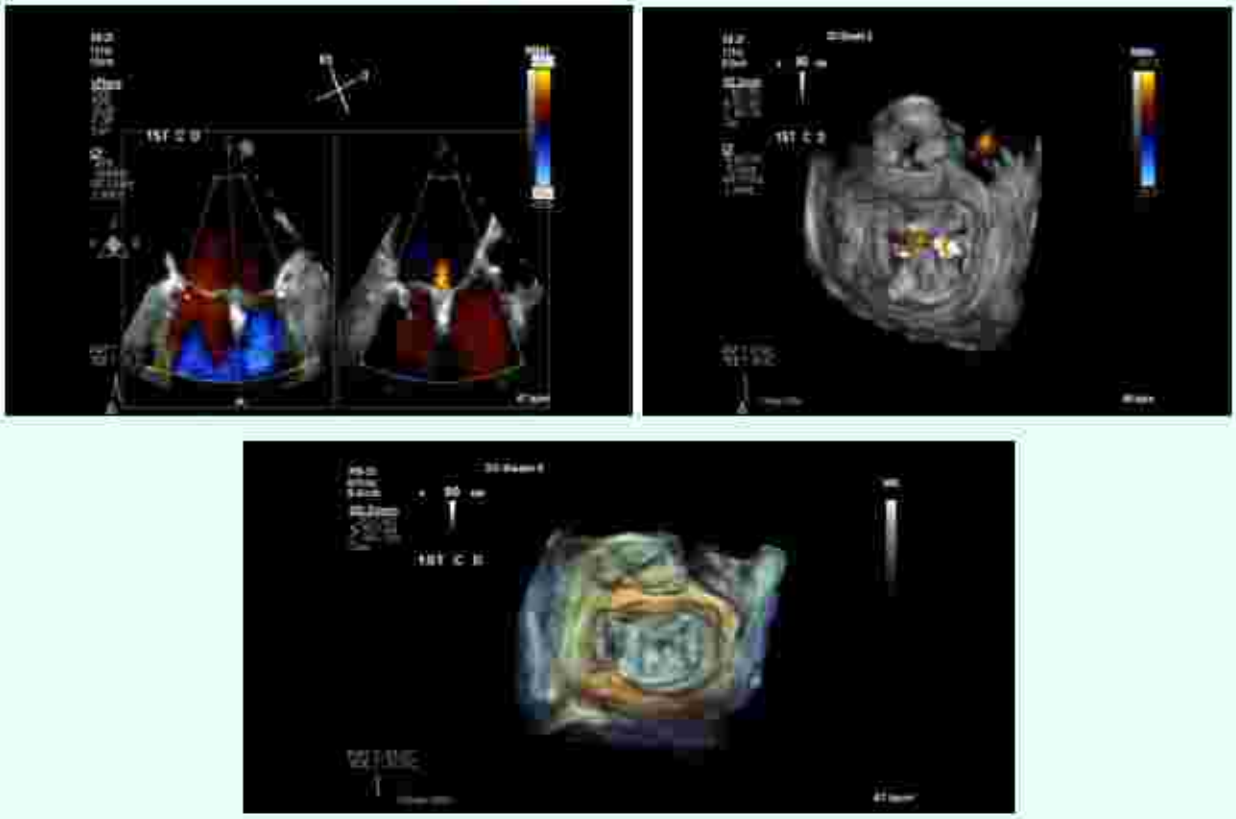
**Release and add 2nd clip**







## Post-release Assessment



# Conclusion

1. **Patient selection and pre-procedural assessment of MV are key for MitraClip success**
2. **2D and 3D echo is invaluable for procedural guidance and confirming success**
3. **Echocardiographer is co-proceduralist: effective communication**

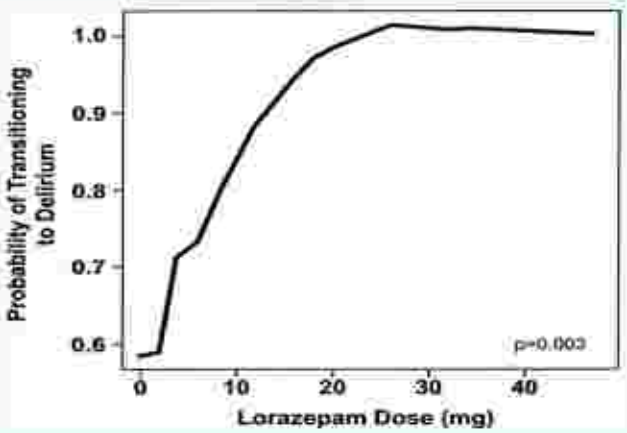
# ICU 病患谵妄 DELIRIUM 杂谈

麻浩波， MD
麻醉/重症监护
Beth Israel Deaconess Medical Center
Harvard Medical School, Boston, MA

谵妄是重症监护病房里一个很常见，但又很棘手的问题，特别是在老年病人身上更为常见。谵妄带来的危害包括：增加病人死亡率，延长机械通气辅助呼吸时间，延长住院时间。即时出院后，有过谵妄的患者恢复得也比无谵妄的患者慢。那么，谵妄在哪些人群容易发生？哪些因素可以诱发？又该如何治疗呢？

谵妄往往反映了机体系统性的问题，以神经系统表现最为突出，特别是那些中枢神经系统功能本来就不好的患者，例如老年人，已经有脑萎缩，脑退化，或者其他认知功能障碍的，在重病的情况下，机体的炎症反应，脑部的灌注降低，都会影响到大脑，表现为谵妄。临床上，若患者出现谵妄表现，临床医生首先要分析鉴别，积极治疗可逆的诱发因素　例如中风，脑炎，感染，低血糖，肝功能异常，尿毒症，甲状腺功能减退，癫痫，甚至药物的毒性反应。

某些药物会诱发谵妄，尤其需要避免使用。在一项经典研究中，研究人员非常细致地分析了不同镇静药物，发现使用了劳拉西泮（LORAZEPAM）的病人发生谵妄的几率大大增高，而且给的剂量越大，谵妄发生几率越高（见图）。此后，临床医生就避免给重症监护的病人劳拉西泮或同类的药物。



- Pratik Pandharipande, et al Lorazepam Is an Independent Risk Factor for Transitioning to Delirium in Intensive Care Unit Patients. Anesthesiology 2006


除了劳拉西泮以及同类的苯二氮卓类（BENZODIAZEPINE）药物外，还需要避免的药物包括 唑吡坦（AMBIEM），苯海拉明（DIPHENHYDRAMINE），甚至有些抗生素，氟喹诺酮类（FLUOROQUINOLONE）抗菌素，也和谵妄有关联。

在预防上，要特别注意不要打乱病人的夜间睡眠，例如，不要半夜抽血，保持夜间安静，灯光控制。褪黑素（MELATONIN）对于帮助病人睡眠有较好的效果，可以每晚常规使用。如果病人存在疼痛问题，需要积极镇痛治疗 从对乙酰氨基酚（ACETOMINOPHEN）开始，依据疼痛环节情况再加按需的阿片类药物。

如果谵妄发生，在排除了其他需要处理的问题后，焦躁型的谵妄往往需要抗精神类药物治疗。药物治疗的目的是为了防止病人对自己或他人造成伤害。常给的抗精神类药物有三种：氟哌啶醇（HALOPERIDOL），喹硫平（QUETIAPINE）和奥氮平（OLANZAPINE）。氟哌啶醇常被用来处理焦躁型谵妄急性发作，但使用时需监控病人的心电图，警惕氟哌啶醇所致的 QT 间期延长的问题。喹硫平只有口服制剂，常用来维持治疗。奥氮平的剂型多样，而且没有延长 QT 间期延长的问题，但半衰期较长（30 小时）。

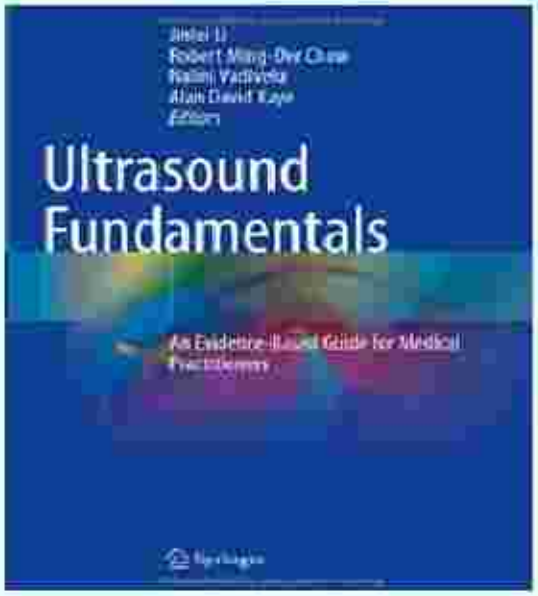
最后提一下一个重症监护常用的静脉泵滴注用的镇静药 右美托咪定（DEXMEDETOMIDINE）。这是一个选择性的 ALPHA 2 受体激动剂。在药理学上，右美托咪定通过减少神经接头处去甲肾上腺素（NOREPINEPHRINE）的释放，起到镇静作用。此药优点是不抑制呼吸，所以常用于重症监护患者焦躁型谵妄的处理。但是在使用此药时要注意副作用。右美托咪定对心率、心输出量和血压都有负面影响。所以要避免使用在心率低、心输出量低的病人。也要避免使用较大剂量。

综上所述，谵妄是一个重症医学领域常见的问题，处理上主要是避免使用容易诱发谵妄的药物，注意排除并积极处理可逆因素，以及尽快控制焦躁型谵妄病人的急性发作。对于谵妄，目前还没有特效的处理方法。

# About my first ever book on ultrasound and medicine

Jinlei Li M.D., Ph.D., F.A.S.A.
Associate Professor
Program Director, Regional Anesthesia and Acute Pain Medicine Fellowship
Department of Anesthesiology, Yale University School of Medicine
Director of Regional Anesthesia and Acute Pain Medicine Service, Yale New Haven Health

作为一个典型的理科生，写作对我来说就像挤牙膏，多一个字也难，自然出版一部书从来就不在我的人生计划之列。某一日与一个多年老友酒足饭饱后聊起了医学超声的现状和未来，两人都感慨万千。我们当年医学院，住院医师甚至专科培训的经历再过十年恐怕就跟不上时代了，新一代的医学生在医学院就开始使用超声，就象我们当年开始拿听诊器的时候。我们突然感觉未来很渺茫，几番挣扎之后在那个月朗星稀的夜晚我们决定不服老一把，为我们自己出一本书。就像我在书中前言中写到的




"As a physician, I am certainly not the only one who can appreciate the increasingly important role that ultrasound plays in education and patient care. Some consider ultrasound to be the new stethoscope, which is certainly not an overstatement in my mind. As a matter of fact, I personally feel ultrasound techniques supply us with a third eye to look deep into the human anatomy, physiology, and pathology, from top to bottom. Training to effectively use this third eye should start in medical school, which is one of the reasons why I wanted to create an introductory ultrasound book for medical students, the future of medicine. In addition, there are many health care workers, including practicing physicians, physician assistants, nurses, advanced nurse practitioners, and physical therapists, who need to use ultrasound at work, but did not have adequate training in the past. Therefore, a visual tool that would allow health care workers to learn on the job effectively and efficiently is desirable. These considerations are the motivation behind this book, along with the

hopes of empowering learners and practitioners with the ability to visualize the body from head to toe via ultrasound. Unique and pragmatic, *Ultrasound Fundamentals* is a back to basics manual on normal and pathologic sonoanatomy of the head and neck, upper and lower extremities, chest, abdomen and other major organ systems.

In this book, for every chapter we invited experienced physicians who actively practice in a variety medical fields while using ultrasound. This concise, image-enhanced and evidence-based ultrasound text includes key topics ranging from the head and neck to the upper and lower extremities, covering all the clinically relevant sonoanatomy. In addition, this 33-chapter book was divided into six sections, including ultrasound basics, Head and Neck Ultrasound, Upper and Lower Extremity Ultrasound, Chest and Abdomen Ultrasound, Ultrasound in Specialty Care, and Emergency Ultrasound. This fundamental book emphasizes the practical use of ultrasound for the diagnosis and treatment of a multitude of conditions in various specialty areas such as airway management, cardiovascular disease assessment, pulmonary status evaluation, orthopedics, gynecology and pediatrics. The optimal techniques and the step-by-step interpretation of normal and pathologic sonoanatomy are discussed in detail. This text can be used as a starting point for the study of ultrasound guided diagnosis and treatment, a refresher manual for sonoanatomy on major organ systems, or a last-minute guide before a bedside procedure. There is a great breadth of material that is covered in a comprehensive manner, making it a great resource for board review and exam preparation for various medical, surgical and allied specialties. Unique and pragmatic, *Ultrasound Fundamentals* is a back to basics manual on normal and pathologic sonoanatomy of head and neck, upper and lower extremity, chest, abdomen and other major organ systems."

换句话说，尽管我邀请了大家都熟悉的北京医科大学的杰出人才，耶鲁大学医学院急诊超声大拿，还有我在加拿大麦吉尔大学医学院的同窗好友，这本书的宗旨就只是一个用超声来进行全身体检的基本手册。您可以选择用半小时的时间翻阅有兴趣的章节，也可用几个周末的时间集中欣赏书中精彩的人体重要器官超声图像。我谨以此书献给所有与我有共鸣的同龄人。

国际交流

# 中美儿童医院麻醉手术科不同管理的思考

仲山，MD

南京市儿童医院

2019 年-2020 年，在江苏省政府留学基金的资助下，本人来到了美国德克萨斯州儿童医院和达拉斯儿童医学中心进行访问学习，期间在麻醉手术科、术后苏醒室、心脏中心参观学习，零距离的接触到了美国儿童医院麻醉手术科的工作和学习，并留下了深刻的印象，看到了许多值得学习的地方，感触颇丰。

1. 医院简介

德克萨斯州儿童医院和达拉斯儿童医学中心都是历史悠久的医院，其中德克萨斯州儿童医院，2020 年全美最佳儿童医院排名第三名，儿童心脏中心和癌症中心排名第一。达拉斯儿童医学中心是私立非盈利儿童医院，床位数 496 张，2019 年麻醉手术数量达到 46000 余例。是地区性重要的儿童医学中心。

2. 麻醉手术科的日常工作的几点感触

2.1. 交班

中国儿童医院麻醉科早上八点交班，交班内容为 夜班手术情况，毒麻药品管理交接，当天特殊病例讨论，科室主任提醒科室医疗，教学，科研管理注意事项，尤其需要各麻醉医生注意要点。

美国儿童医院麻醉科每个工作日早上 6 点 30 分开始科室业务学习，早上 7 点 30 分开始麻醉工作，雷打不动的执行。早上不集中交班，所有需要传达的关于科室管理、临床、教学、科研注意内容，都由麻醉科秘书通过群发电子邮件发送给每一位麻醉医生，或者点

对点发送，每一位麻醉医生都会严格执行，只要制定好制度，每个人都会无条件执行。通过各种管理制度来进行科室运行，责任到人

2.2. Time-out

中国手术室进行 Time-out 时，在麻醉前，常常是由麻醉医生主导，提醒外科医生、护士进行核对，一般核对病人信息，手术部位，尤其左右侧等信息，按照要求进行三方核对，通常从接病人到手术开始核对三次。

美国手术室进行 Time-out 时，一般由主刀医生负责开始第一次核对，核对时，全体在手术时的人员均要站到各自岗位，不能随意走动，仿佛是在进行一个神圣的仪式，核对的内容除了病人信息，手术部位外，主刀医生需要介绍病人一般情况，手术大体方式，手术的风险性，可能的出血情况。麻醉医生手术需要介绍自己，然后是患儿的准备麻醉方法，术中麻醉风险，准备的操作内容。洗手护士需要介绍手术台上手术器械准备情况，巡回护士需要介绍台下需要配合的注意点等，就是像麻醉助手以及参观人员都需要介绍一下自己，名字，是来干什么的，全场人员都介绍完成后，Time-out 才宣布结束，麻醉医生才开始麻醉病人。

这种每天严格而全面制度化的核对方式，能看出他们对待每项制度的遵守，即使在常人眼里是习以为常的事情，只要建立了清单，都一丝不苟按照清单来进行。

对于一些突发的事件，还会有相应的处理指南，在每个手术间都能看到这些指南的文件，大家在遇到紧急的时刻，都能够有理论依据可以去遵循操作，可以在第一时间降低医疗的风险，增加救治的成功率。

2.3 术中麻醉管理

中国小儿麻醉的术中麻醉管理和美国的同类手术的麻醉管理都大体相同，美国儿童医院手术室里，由于各种设备都很齐全，比如每个病人都可以使用超声辅助下动静脉穿刺，增加成功率，减少并发症，国内儿童医院无法做到这么全面。

儿童麻醉诱导阶段，首先患儿入室后，吸入七氟醚和 N2O 的混合气体进行吸入诱导，准备各种口味的液体涂于面罩，让患儿能够接受面罩，减少恐怖感。等吸入麻醉起效后，再穿刺外周静脉，常规诱导，麻醉维持阶段主要以吸入七氟醚为主，辅以其他镇痛药物等。麻醉苏醒阶段，主要以深麻醉下拔管，维持一定镇静，让患儿安静状态下从手术室进入麻醉苏醒室。麻醉苏醒室非常强大，麻醉苏醒室为一个个隔间的分布，每个隔间有一

张病床，有监护仪，中心供氧，呼吸机等，条件相当于国内的监护室的标准。手术结束后由麻醉医生和巡回护士陪同送入麻醉苏醒室，麻醉医生，巡回护士，麻醉苏醒室护士，医生一起参与交班，交流患儿情况，手术情况等。在麻醉苏醒室每个隔间都有一名护士负责监护，家长也被允许在这个地方陪同患儿，可以安抚患儿的情绪，但是一切护理工作都由护士来进行。麻醉手术科室的这种管理充分体验到了医院的人文关怀精神，即照顾到了患儿的安全，又减少家长的焦虑情绪。

### 2.4. 手术室的标准化流程

在美国访问期间，我有幸参观过美国德克萨斯州儿童医院，达拉斯儿童医学中心，赫尔曼医院，波特兰医院的手术室，给我的感触是，在手术室里，麻醉机、监护仪、手术床等设备摆放位置都是固定的（手术时如果需要移动手术床，可以移动，但是手术结束后都需要归位）。麻醉机和监护仪，以及微量输液泵等常规设备都是相同的品牌，药品的使用，摆放的位置，气管插管的准备，都可以说是相同的，可以说都是标准化流程进行。

标准化流程的进行，我想不得不提及美国强大的医学专业规培体系的运行，使得麻醉科的医生，就是在不同医院，无论是私立还是公立，无论是顶级还是普通医院，思维方式，操作步骤，物品摆放都是标准化。

规培体系可以培养出牢固的理论基础和临床操作能力，他们的医生培训体系，普通本科毕业要考入医学院不是件很简单的事情。对医学生质量的高要求使得对每年的医学生源的人数加以限制，这就使得医学生本身就成了高素质的群体。医学生的培训也是十分辛苦的（早 6 点几乎是他们开始每天繁重工作的时间），期间不仅要掌握各自专业的实际操作能力还要对相应的理论基础知识加以补充学习，常常看到这些规培医生拿着一本本厚厚的专业书。所以能成为合格的主治医师是要经历艰苦的一段时光，当然，医生的待遇还是很高的，也受人尊重，我想这也是医学生奋斗的动力吧。

### 2.5 日间手术的模式管理

能够保持高效运作的同时又能保证患者的安全。美国强大的日间手术的模式管理得益于美国医院发展的思路，就是大门诊，小病房，许多服务都可以在门诊完成，包括所有实验室和影像学检查，术前检查。依靠信息系统建立的强大的预约制度，缩短候诊时间，形成了比较先进的完善的私人医生诊疗体制，实行 24 小时应诊，私人医生可以推荐转诊。美国医疗机构设置合理，私人诊所，大中小型医院，针对不同人群做好服务工作。

美国儿童医院的日间手术的模式管理特点，美国儿童医院的床位数不是很多，尤其是外科病房，但是每年的手术量很大，国内同等的手术量，需要几倍的床位数，这主要得益于美国儿童医院的日间手术的模式管理。在美国儿童医院，患儿都是在手术当天入院，包括简单手术和复杂的心脏手术，神经外科等手术，手术结束病人在回家后，在家人，家庭医生或者社区医生的照顾下度过术后恢复期。

美国儿童医院日间手术量可以占到总体手术量的 80%以上。这样既可以节约医疗费用，医院资源，又可以降低感染等并发症的发生率。

日间手术操作按部就班，首先按照预约时间准时来到医院办理入院，安排好床位后，由专门的护士可以负责照顾，麻醉科医生就会到病房前交代麻醉风险及术后注意事项。回答患儿家属的问题，签过字统一接受麻醉后，由医生和护士护送进入手术室。在手术室里，外科医生、麻醉医生、巡回护士核对患儿的身份和手术相关信息，确认无误后，开始麻醉，手术结束后拔出气管导管或者喉罩，患儿镇静状态下送入恢复室，家长会在患儿旁边守候，也有专业的护士进行护理，一对一服务。等患儿平稳后，精神恢复，评估达到出院标准后，安排出院。出院回家后，有什么问题，可以联系私人医生进行诊断、治疗。

从门诊预约手术，到手术当天住院，麻醉科麻醉手术，术后苏醒室的复苏，术后评估出院标准等等，都有一整套为日间手术服务的流程。在美国这套日间手术服务流程从二十世纪 80 年代就开始推广了。

每天在不多的床位数条件下能完成那么多手术，日间手术的开展是重要的一环，而高效的信息系统支撑是维持麻醉手术科运行顺畅的重要保障。稳定的信息系统支撑着高效的医院运转。

中国医院日间手术模式的探索和尝试从 2007 年开始，2013 年日间手术在中国进入快速发展时期，2015 年国家卫生计生委发布了《关于印发进一步改善医疗服务行动计划的通知》中，特别提出了要"推行日间手术"。2016 年，日间手术被列为医改重点工作内容之一，将在全国大力推行。目前国家卫计委对大型医院绩效考核中日间手术的标准是要求 10%以上，以后应该会不断增加。

链接

开展日间手术，一方面可以促进医生护士不断增强自我医疗服务能力和手术能力，往更微创，更精准，更高效的方向发展，另一方面，可以节约有限的住院床位给病情更重，

或者需要更大手术的患者，还能节约患者的医疗费用，减少整个社会的医疗支出。2020年南京医科大学附属儿童医院在全院7个科室推广日间手术病房，目前共设有53张床位，包括25个病种。共完成日间手术7千多例，占所有手术的29.2%。由于我们医院一院两院区模式的特点，日间手术服务模式以集中与分散管理并行的方式开展。

在美国儿童医院的访问学习，短暂而充实，使得我对美国儿童医院麻醉手术科室的日常运行、美国医学教育培养、顶级医院的临床和科研水平有了初步了解，开阔了视野，发现了自身的不足。这次的访问学习必将会受益终生。

水底远山云似雪，桥边平岸草如烟。唐 刘禹锡

摄影 谢燎阳医生

## 住院医园地

# 从医记

李娟， MD
麻醉科第三年住院医生
Beth Israel Deaconess Medical Center, Boston, MA

我来自四川内江，古称汉安，美称甜城，是孔子之师苌弘和国画大师张大千的故乡，属于四川省的地级市，位于四川省东南部。家里除了我，还有一个姐姐和一个妹妹，我父母是经商的，虽然家里条件普通，但父母在养育我们三姐妹上没少花功夫。我们学习都很自觉努力，没让父母操心太多。我的童年无忧无虑，偶尔也能贪玩，但到了初高中，在应试教育的压力下，一直学习没有闲着，最后活成了"别人家的孩子"。

大我两岁的姐姐考进中科大材料系，妹妹喜欢数学去了南开计算机系。我是最没想法的，虽然高考成绩比她们稍好，却不知自己真正想成为什么样的人。高考时只想考一流大学，直到看到自己上了清华分数线才跟父母家人商量去哪个系。当时家里说应该多元化，若成为医生，将来工作好找，家人看病也方便。我就这样带着家族的"希望"和"重任"走上了求医之路。北京协和医学院当时在清华招生，我当年运气较好，协和第一年在四川招生。我就成为协和在四川招的 5 名高考生之一。

在清华的 2 年，自己虽学习刻苦，也只能是班上的中游水平。上了大学才知，果然是山外有山，人外有人。来自三四线城市的自己在北京这个繁华的都市，在清华园这个人才济济的地方，第一二年并没有找到方向，面对大城市来的同学，成绩好，见识广且又多才多艺，我心里有些自卑。清华的 2 年半医预科很快就过了，跟临床无太大的关系。喜欢科研的同学转生物系了，不喜欢学医的也都早早转它系了。对于未来，我没有太多想法，就觉得还没有接触临床，喜欢与否尚未可知。

第三年我到了协和医学院本部，这才开始认真思考以后的工作和事业。到了协和，什么都变小了，在王府井东单这个寸土寸金的地方，从清华园的大活动区变成了宿舍，教学

楼，医院的三点一线。没有了美食和课外丰富活动的诱惑，人际关系也变得特别简单，我的心里反而踏实了。在这个喧闹的都市中心，居然有两栋楼的人们潜心地专研学术。据说协和基础所是全国院士密度最高的地方。顾方舟先生，我们的老院校长，国际著名医学家、病毒学家，我国消灭脊髓灰质炎（简称"脊灰"，俗称"小儿麻痹症"）元勋，世界控制脊灰的关键贡献者之一。林巧稚大夫，大家熟悉的「万婴之母」-协和的另一位在医学上登峰造极者，她同时又是极富人性和高贵、慈善品质的人。我怀着这样一种质朴的情怀，开始如饥似渴地学习。协和的基础教学使我受益良多，我觉得自己是骄傲的，在这样一个有使命的学校，有这样的前辈老师，继承传承从事一份崇高的职业。我开始慢慢喜欢上协和，开始喜欢当一名医生，而且下定决心要努力成为一名优秀的医生。在这里成为一个人一生事业的起点，那是多么美好的开始！

北京协和医学院是美国洛克菲勒基金会出资，按照当时美国约翰霍普金斯医学院标准建院的。对于 20 世纪初期为中国服务和促进中国发展的中美人士来说，北京协和医学院是他们长期以来紧密联系的明证。在 20 世纪初叶中国饱受战争蹂躏的年代里，中美两国人士齐心协力，克服种种艰难险阻，将其建成了世界一流医院。能去美国医院看看这个曾经帮助过我们的老朋友医院到底先进在哪里，成了我的一个梦想，它像一颗种子悄悄在我心里发芽。在协和学习的第三年有百歌医学的人到协和来做美国行医专场。我才第一次知道可以到美国当住院医师，甚至主治医生。

我非常兴奋，开始了解 USMLE 并着手准备。这不是一条简单的路，考试准备了 2 年，这个期间我阅读了大量英文医学教材和医学题库。美国的医学教育体系非常完善，协和多年使用教版教材与之差距较大，虽然协和的老师也可使用英文教材并英文教学，但毕竟不是普遍现象。除了医学教材比较落后，临床轮转呢？有幸在协和校友的帮助下，我到克利夫兰麻醉科和麻省眼耳医院麻醉科轮转了 2 个月。考完 STEP1 之后我又申请到 Mayo Clinic 麻醉科轮转一月，我越来越喜欢麻醉科这个专业，很多操作为我所喜，学到的医学知识能学以致用，非常有成就感。这个期间我拿到了一些推荐信，对之后的面试大有帮助。再后就是 Match。这条艰难的路，即使现在回忆起来，都觉不易，然而回味甘甜。

转眼我已经是第四年的住院医生，马上面临毕业。这四年来我经历了无数的磨练，从一个连药都不会抽的医学生变成一名快要独立行医的医生。从第一年 Intern 开始，到后来三年的麻醉专科，庆幸一路有很多主治老师对我的帮助。毕业后可 Waive 三年，我准备先去私立医院工作。远期归属尚无定论。十年前完全不能想象十年后的我在异国他乡，

并成为一名直接服务于病人的麻醉医生。我相信自己还有初心，犹如那首《少年》所唱的：

"我还是从前那个少年
没有一丝丝改变
时间只不过是考验
种在心中信念丝毫未减
眼前这个少年
还是最初那张脸
面前再多艰险不退却
……"

阳春布德泽，万物生光辉。少壮不努力，老大徒伤悲。汉《长歌行》 佚名

摄影　黄黎光医生

# 关于我们

CA 1 and 2 Residents
Department of anesthesia
Beth Israel Deaconess Medical Center, Boston, MA

**Carmen Zhou MD**

I was born and raised in San Francisco in a large family that I miss dearly. I went to college at UC San Diego where I studied molecular biology and eventually made my way to the east coast at Harvard Medical School. Like many people, I stumbled upon anesthesiology accidentally and made the best choice of my life when I ended up pursuing it. I chose this field because I wanted to work with a diverse set of patients in a very direct way. My experience at BIDMC so far has been a gift, and I look forward to learning and growing alongside the best peers. In my free time I like to hang out with my cute cat, practice piano, and play games virtually with my siblings

**Minxian Liang, MD**

My name is **Minxian Liang** (Maxine), and I am from China. Before graduating from Sun Yat-sen University School of Medicine, I did a few months of clinical rotations in the US. At Beth Israel medical center, OB anesthesia was the one of the best elective rotations as I had no idea what anesthesia was like beforehand. All the residents I worked with were terrific, and the education was excellent. After graduation, I had an opportunity to participate in clinical research in OB anesthesia at Brigham and Women's Hospital. All these experiences eventually lead to anesthesia as my career. I was fortunate that I could come back to BI for residency, and I have been enjoying every day of it. When I have free time, I enjoy cooking, traveling, and playing with my cat Boylston.

非洲小狮，憨萌可掬，逍遥自在，兴则高歌困则眠。

摄影：汪红医生 from CASA

CASA Bulletin of Anesthesiology
Is an official publication of
Chinese American Society of Anesthesiology (CASA)
ISSN 2471-0733



Email: chineseasa@gmail.com

Facebook: CASA CASA

Wechat: CASA Bulletin

Website: www.chineseasa.org