

Reconstructive Surgery: Conundrums Conundrums

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Nonfinancial: The presenter has no relevant nonfinancial relationship to disclose

DISCLOSURE

I Mark K Wax MD
have no relevant financial
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MUSC & OHSU



UK & OHSU



Suggested Topics From Judith

- Head and neck cancer
- Thyroid disease
- Fibula flaps
- How to do fibula flaps fast
- How to have your fibula flaps live
- How to have your fibula flaps not with
- Why is there always a second flap
- What is the best way to prevent a second flap
- What the chyle leak
- When is a chyle leak
- Can I do that flap
- Scalp reconstruction
- Free scalp flaps
- Scapula flaps
- Latissimus dorsi flaps
- Leg flaps
- Belly flaps
- Rectus flaps
- How not to do a flap
- When not to do a flap
- Who not to do a flap on
- Why would you not want to do a flap
- Craniofacial resection
- Craniofacial reconstruction
- ALT flaps and craniofacial reconstruction
- LAD flaps and craniofacial reconstruction
- Total rhinectomy
- The use of free flaps for total rhinectomy reconstruction
- Delayed free tissue transfer
- Orthopedic free tissue transfer
- Does and clotted IJ affect life
- Free ulnar flaps and their role in head and neck reconstruction
- The use of papaverine and vasospasm
- The use of heparin as a routine in vasospasm
- Free flaps as an outpatient
- Chrysalis flaps for facial reanimation
- To vector gracilis flaps
- 3 factor gracilis flaps
- Crossing or fascial grafting
- Maxillary reconstruction
- Dental rehabilitation
- Placement of jaw in a day
- Subperiosteal implants
- Utilization of oral maxillofacial surgeons

AAFPRS Keynote



TEAM BUILDING

SOMETIMES, THE MOST IMPORTANT LESSON YOU CAN LEARN
IS THAT YOU'RE NOT A VERY GOOD TEAM.

Goals & Objectives

- What keeps us in the game
- Flap compromise and salvage
 - Detection
 - Intra-op
 - Post op
 - How do we get back
 - When do we toss the flap and what do we do???
 - 3D modeling Computer simulaton

What Do Otolaryngologists Do Well



What Makes Us Obsolete



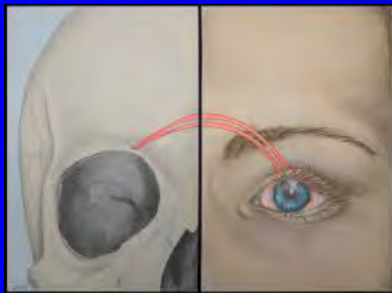
- Ezrin C, Briant TD, Firestone G, Rosen F. The endocrine aspects of trans-sphenoidal hypophysectomy. Can Med Assoc J. 1967 Jul 8;97(2):72-5. PMID: 6029240; PMCID: PMC1923109.

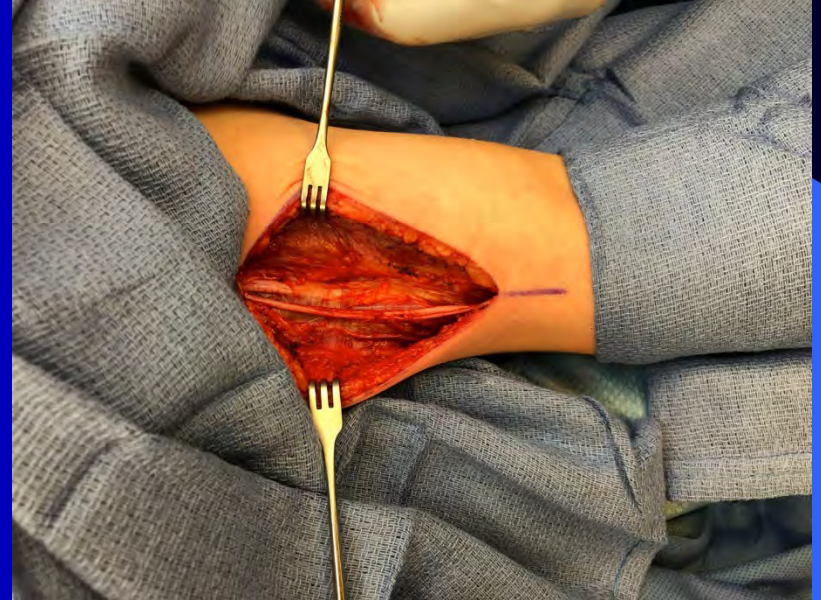
Introduction

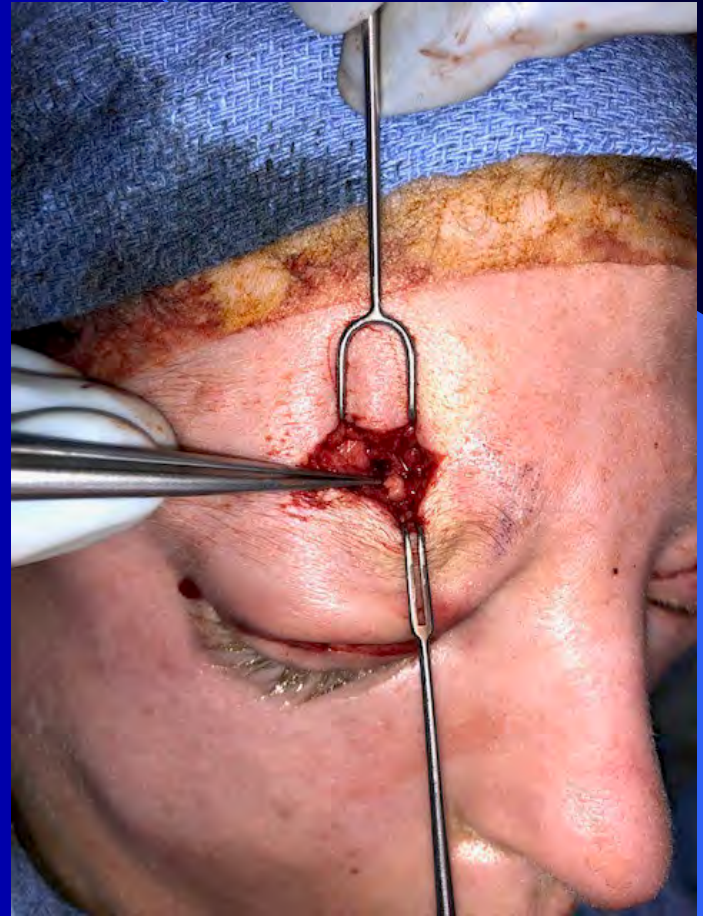
- Corneal anesthesia can be a devastating problem.
- Result in Neurotropic keropathy.
- Corneal ulceration, infections loss of the eye.



Innovation: Corneal Neurotization









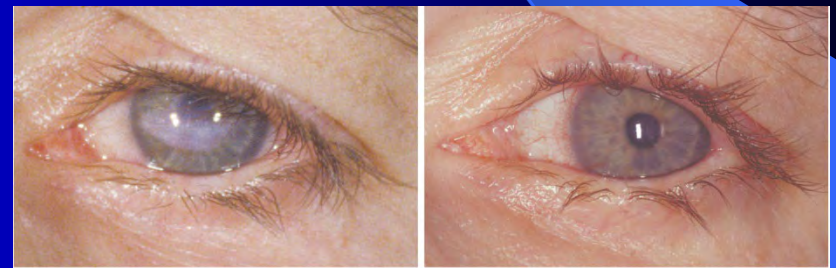
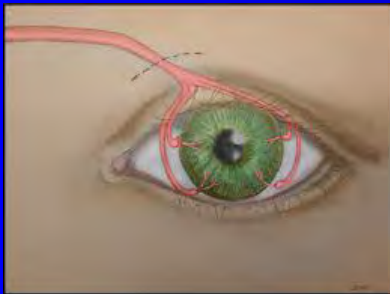
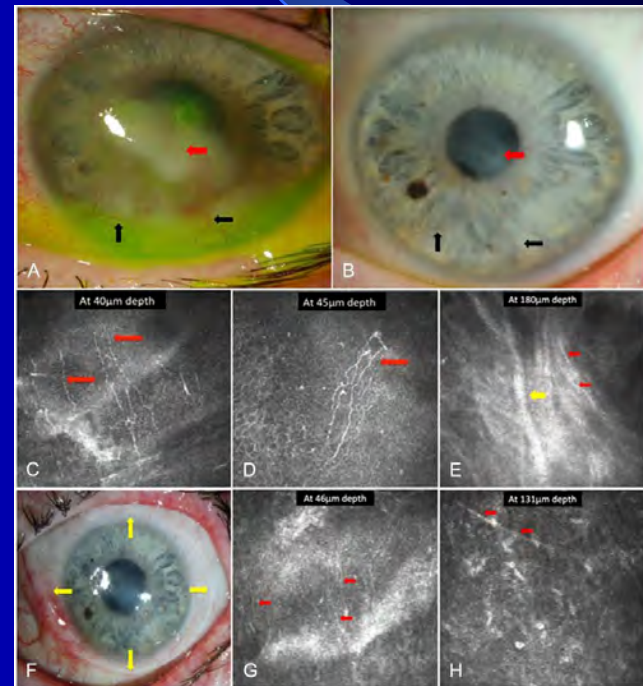


Fig. 4. The left eye of patient 3 preoperatively (*left*) and postoperatively (*right*) shows resolution of the corneal scar after direct

How Do We Lose



What Do Otolaryngologists Do Well

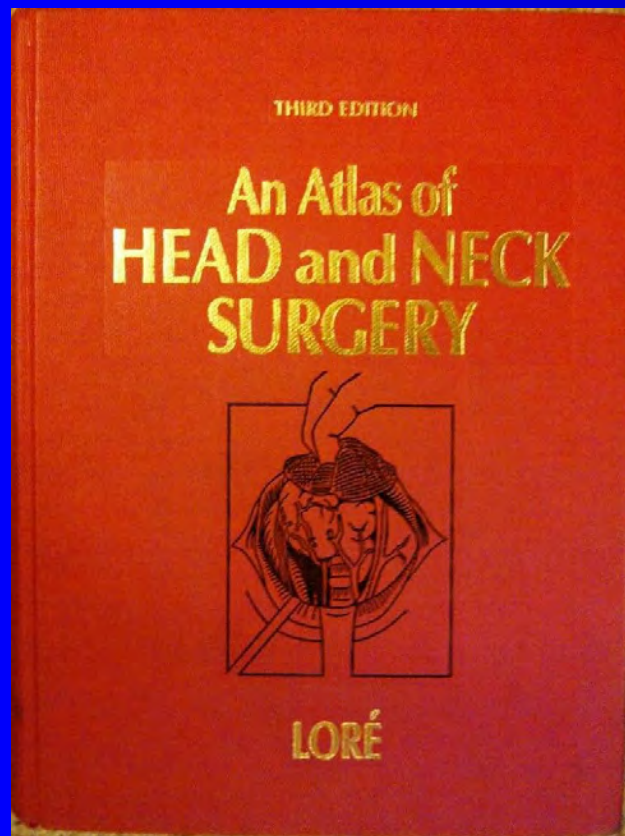


What Does Playing Well Mean

- Neuro-otologists
 - Neurosurgeons
- Rhinology/Skull Base
 - Neurosurgeons
- Head & Neck
 - Spine access
 - Carotid
- Reconstruction
 - Everything else



How Do We Win: Be Better



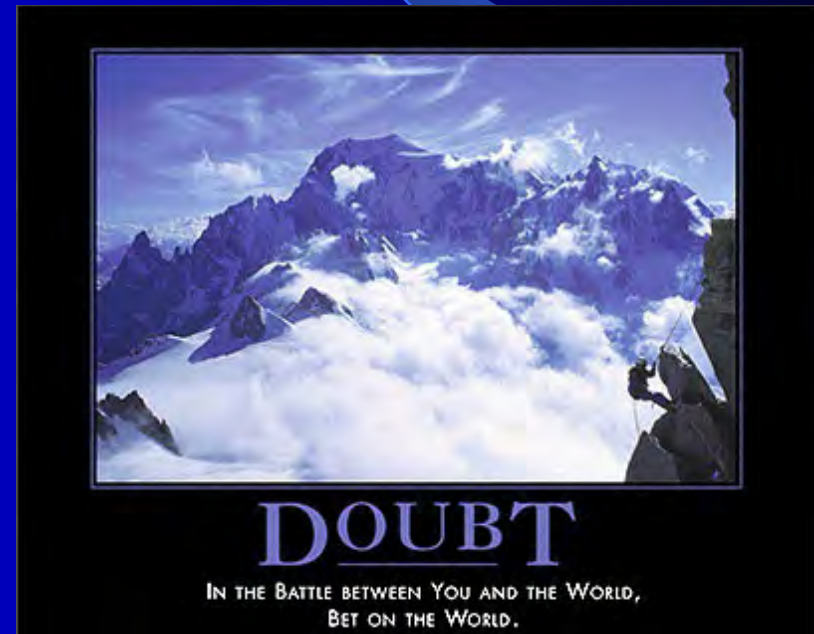
How Do We Win: Skill



How Do We Win

Better care for the system

- ERAS
- Post Op ICU
 - OHSU 25 yrs send Pts to floor
 - 13K—10K—9K





Ward-Level Care for Free Tissue Reconstruction in the Head and Neck: Determinants of ICU Admission

Elliot Morse, MD, MHS

William W. Thomas, MD Alia Mowery James

E. Azzi, MD

Mark K. Wax, MD

Results - Demographics

	No. Patients	%
Gender		
Male	598	69%
Female	266	31%
Medical Comorbidities		
Cardiac	460	53%
Pulmonary	22	3%
Prior Radiation	246	40%
Site		
Larynx	176	20%
OC (w/ Mandible)	186	22%
OC (w/o Mandible)	190	22%
Other	312	36%

	No. Patients	%
Flap		
ALT	162	19%
Fibula	108	13%
RFFF	436	50%
Other	158	18%
Mean OR Duration		
	7.4 hours	SD=2

Results –Ward to ICU Transfer

	No. of Patients	Percentage
Total Patients	864	
Transfer to ICU	90	10%
Post return to OR	44	5%
Flap Salvage	26	3%
Bleeding/Hematoma	14	2%
Washout	2	0%
PEG placement	2	0%
Non-OR Related	46	5%
Cardiac	16	2%
Respiratory	22	3%
Sepsis	4	0%
Altered Mental Status	4	0%

Day of Transfer	No. of Patients
POD 1	12
POD 2	12
POD 3	18
POD 4-7	24
POD 8-14	14
> POD 14	10

Results – Ward to ICU Transfer

		Odds Ratio (95% CI)
Cardiac Comorbidities		
	No	1 (REF)
	Yes	2.7 (1.3 to 5.7)
Pulmonary Comorbidities		
	No	1 (REF)
	Yes	4.7 (2.3 to 9.8)
OR Duration		
	<5 hours	1 (REF)
	5-10 hours	3.7 (0.5 to 29.0)
	>=10 hours	12.5 (1.4 to 109.8)

Conclusions

- 10% rate of ICU transfer
- Half due to return to the operating room
- Half due to medical complications
- Floor monitoring is safe
- Patients with certain characteristics could be considered for direct admission to ICU
- So?????
- Extubated in the OR
 - Fluids
 - Pressors
- Rare Airway issue
- Anesthesia listens
- We are a financial driver
- All our flaps get done
 - No ICU beds... Who cares

How Do We Win: System

- Counting during the “Micro”
- Angst in the OR
- We are calm in the storm



Flap Compromise & Salvage

- Big topic
- Need to address
 - Detection
 - In the OR
 - This is big
 - Post OP
 - Get back to the OR
 - Management in the OR
 - When do you give up
 - In the operating room
 - Primary failure
 - Secondary failure



Flap Compromise & Salvage

Detection

- In Operating Room
 - **Doppler**
 - Capillary refill
 - Poke the flap
 - **Spy**
 - Feel the pulse
 - Old age
 - Vasopressors
 - **Sleep at night**



Free Tissue Transfer

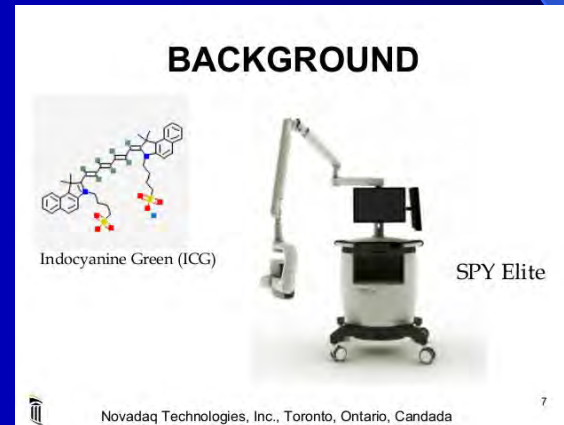
- When it works it great
- When it doesn't
 - Sigh
- Can we detect those partial necrosis?
- Can we identify dead flap intra op?



SPY Technology

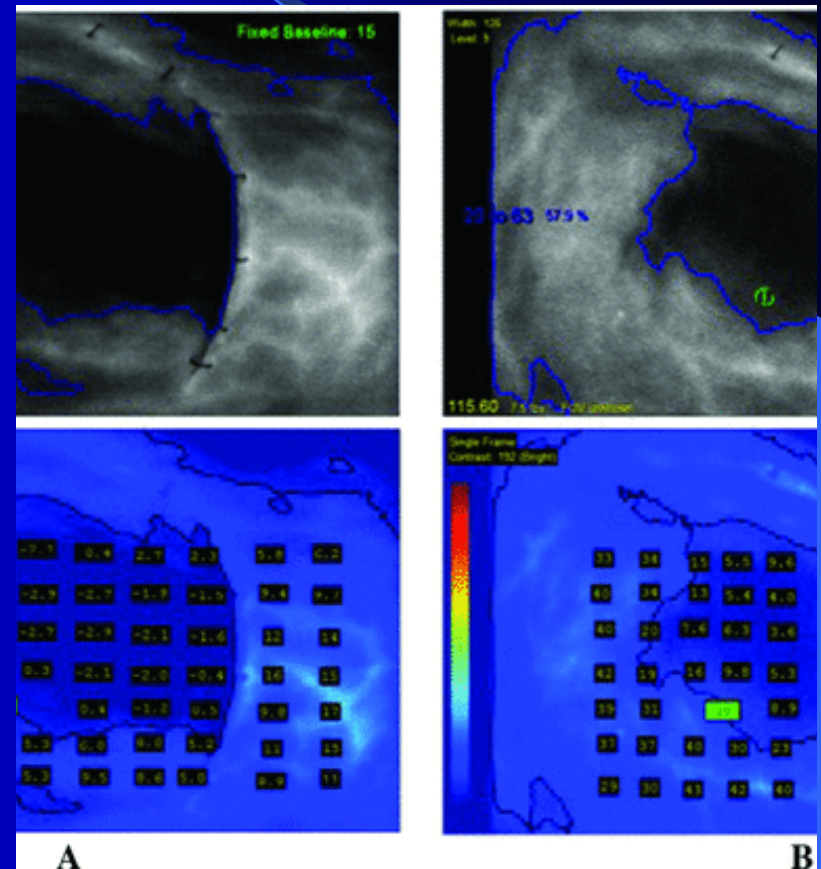
- Fluorescent Angiography
 - Indocyanine Green (ICG)
 - Inject 5 cc
 - Point Camera and watch
 - See the perfusion of the tissue

- Plastics
 - Cost
 - Collaborate/Breast

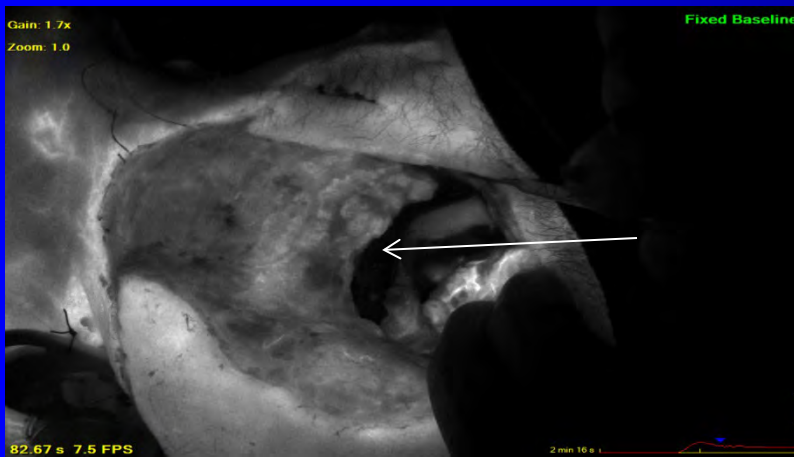


Spy Technology

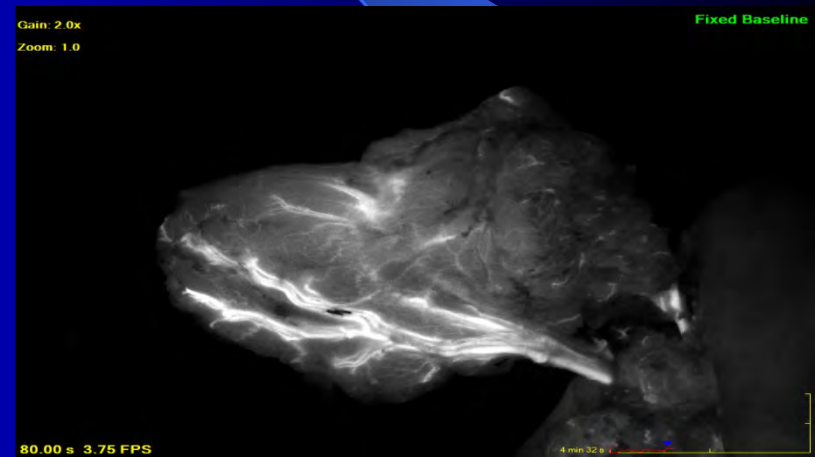
- Able to reliably discern dead tissue
- Revolutionize breast reconstruction



Bony Evaluation: Spy



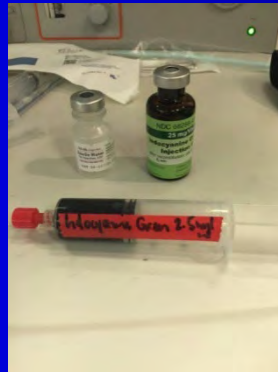
Rib with plate on it



Scapular Tip

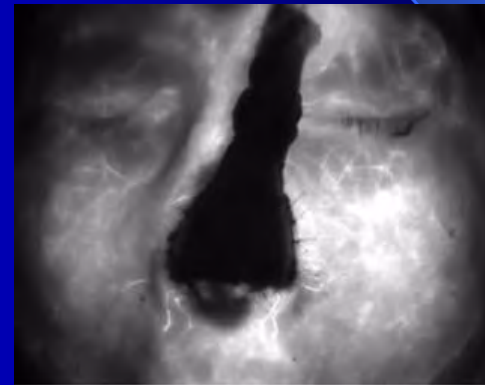


Spy Equipment



SPY in Facial Plastic Surgery

- Forehead flaps
 - Re-vascularize
 - Cut pedicle 6 weeks
- Most et al 2012
 - Demonstrated vascular ingrowth 1 week
- Most et al 2015
 - 10 patients
 - Perfusion good when clamped at 2 weeks
 - Flaps survived



How Can We Expand This

- Flaps are 100%
- Occasionally not true
 - Extended
 - Composite



Spy System



Spy Technology

- 1316 Flaps since SPY arrived
 - 8yrs
- Used in 73 cases (<6%)
- 25 During harvest
 - 10 extended flap
 - Needed to trim 5
 - 6 Viability was questioned
 - 2 dead and replaced
 - 3 “Skin pale”
 - 1 Skin dead
 - 1 Flap dead
 - 6 Funky
 - Perforators, anatomy, trimming
 - 2 skin tossed, bone good

Spy Technology

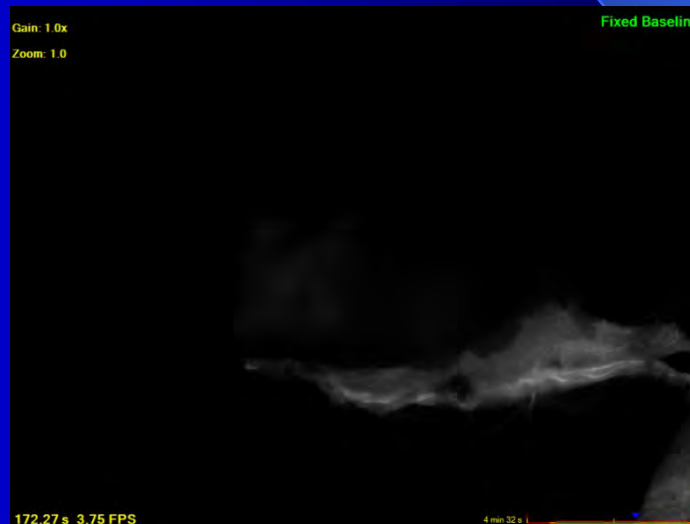
- 39 Post anastomosis
 - 10 large flaps
 - 5 interventions
 - 11 Concern re viability
 - 6 viable
 - Spasm
 - 2 skin dead bone good
 - 1 partial necrosis
 - 2 dead flap
 - 2 died eventually
- 18 assorted
 - Pale skin
 - Spasm
 - Perforators not seen
 - Doppler funky
- 9 Post op
 - Composite tissue
 - 5 interventions

Outcome of SPY

- 39 viable
 - Proceeded
 - 2 flaps died
- 10 skin paddle not viable, but bone or muscle is viable
 - 1 died
- 10 areas of non-perfusion which were trimmed
 - All lived
- 7 nonviable flap..... new flap harvested
- 4 no good flow....eventually restored after some modification
- 1 skin paddle removed

Spy Technology

- Post operative evaluation
- Skin dead
- Muscle alive



Translational

- Extended flaps
 - Cervico facial
 - Septal
 - Pericranial
- Forehead
 - Extent
 - Divide pedicle
- Temporal Bone
 - Ear

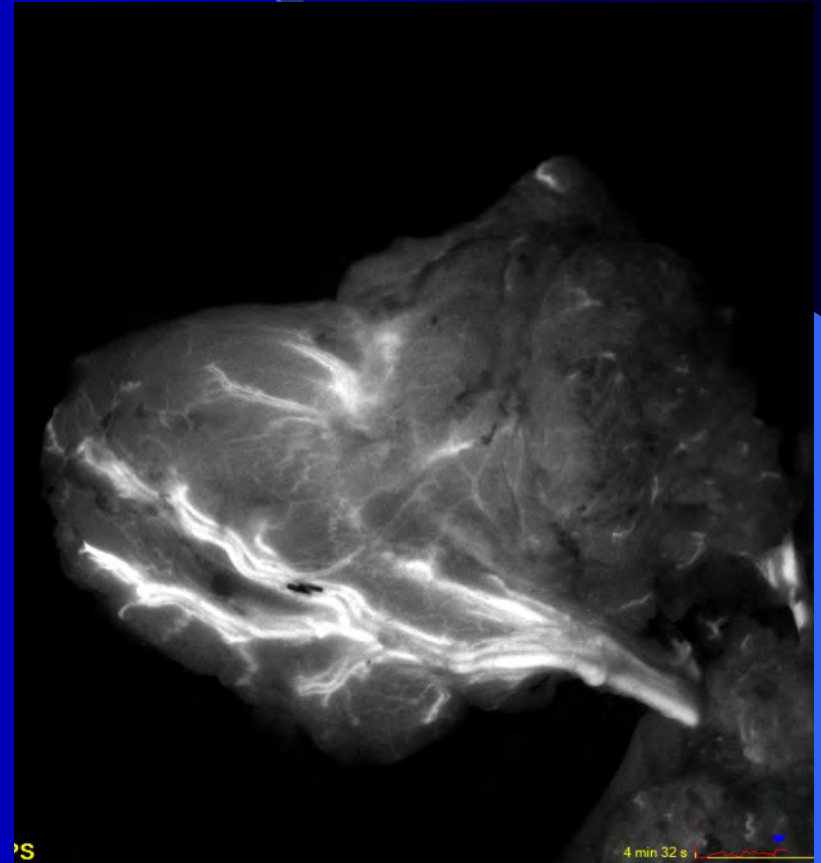


Spy: Big Flap



Take Away Message

- Learn from others
- Keep an open mind
- Technology is translatable



Flap Compromise & Salvage

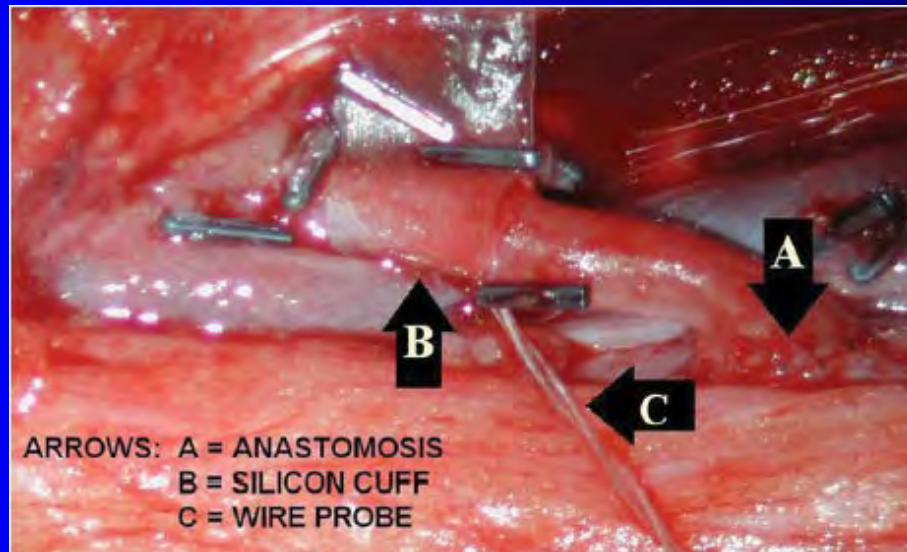
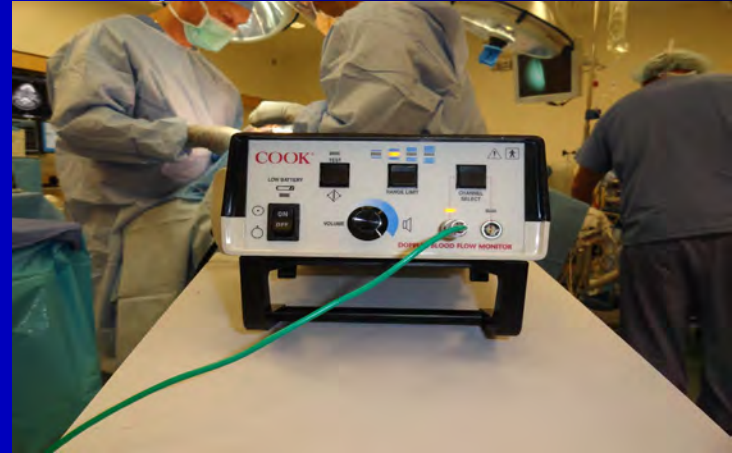
Detection

- In Operating Room
 - **Doppler**
 - Capillary refill
 - Poke the flap
 - **Spy**
 - Feel the pulse
 - Old age
 - Vasopressors
 - **Sleep at night**



Implantable Cook-Swartz Doppler

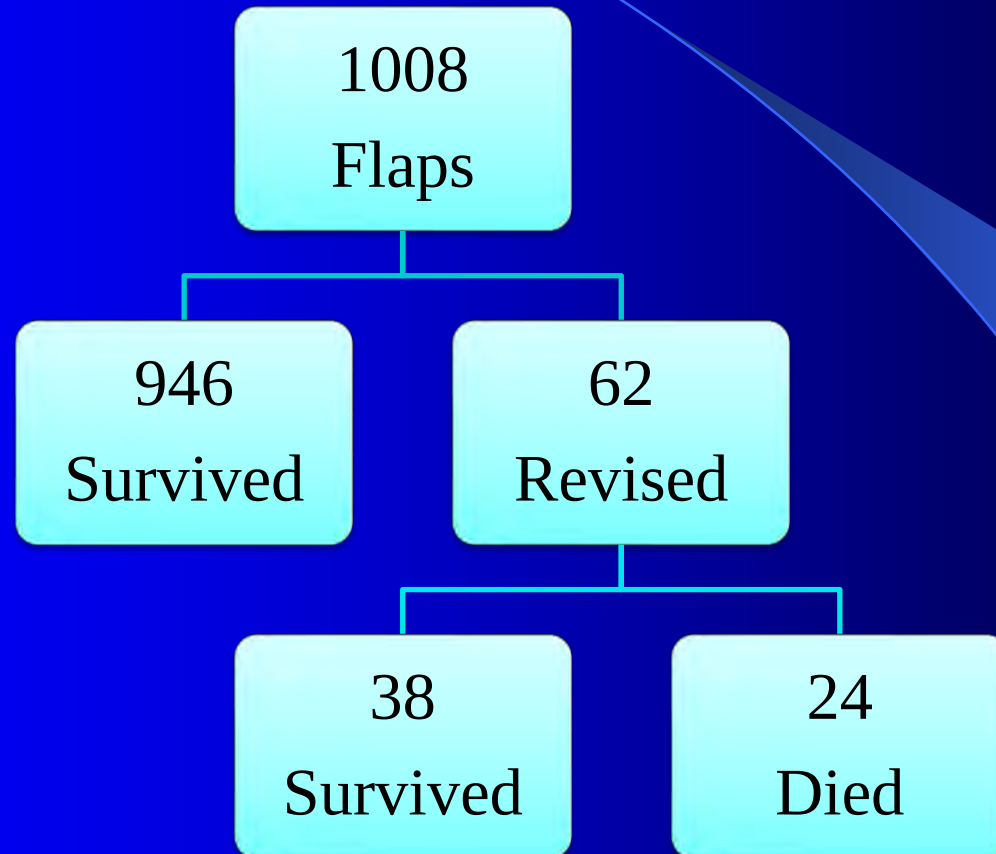
- Implantable device



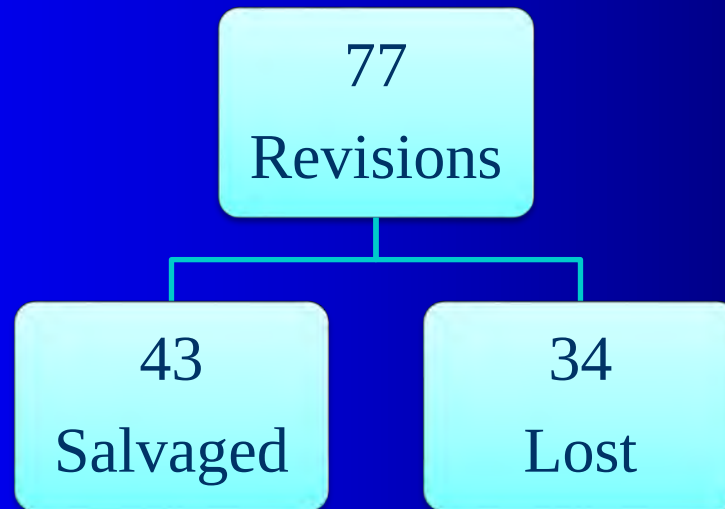
Outcomes in 1142 Flaps

	Total Flaps	Post Operative Revision	Post Operative Revision (%)	Salvaged	Salvaged (%)	Overall Survival (%)
Not Revised	1008	62	6.2	38	61.3	97.6
Revised	134	15	11.2	5	33.3	92.5
Total	1142	77	6.7	43	55.8	97.0

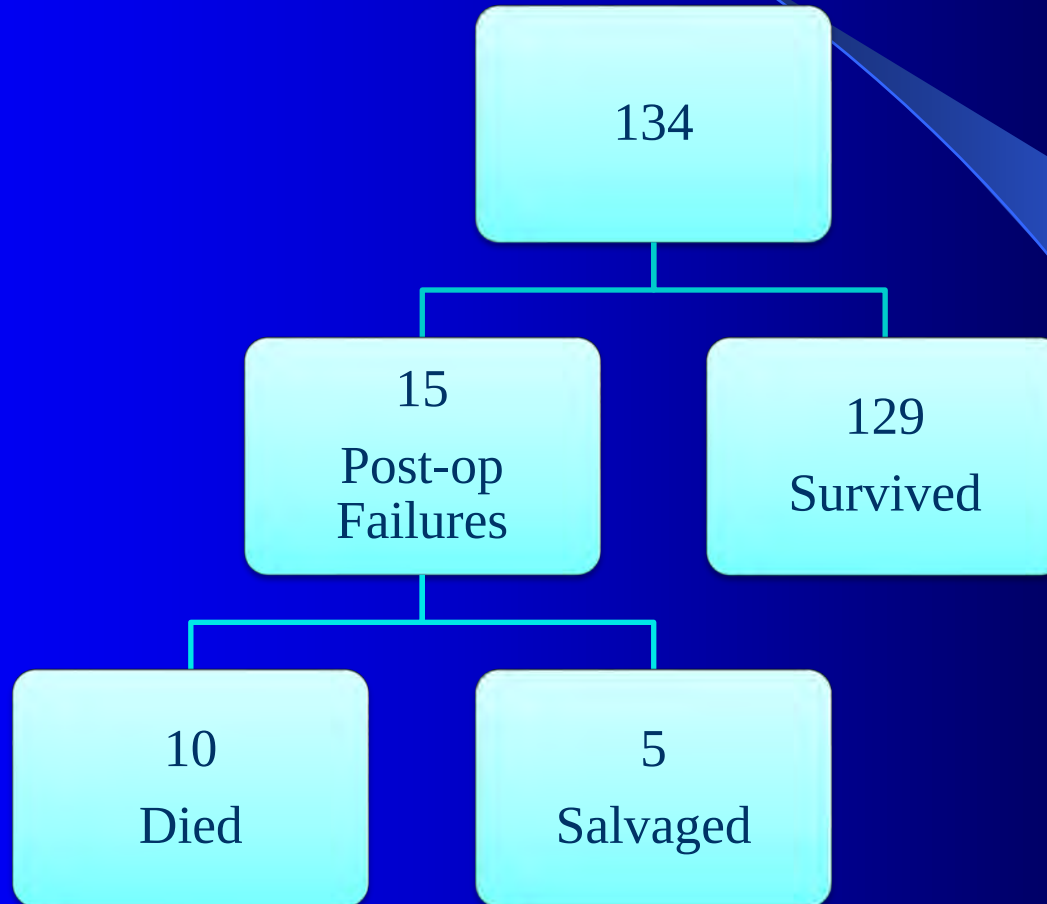
No Intra Operative Issues



Overall Salvage Outcomes



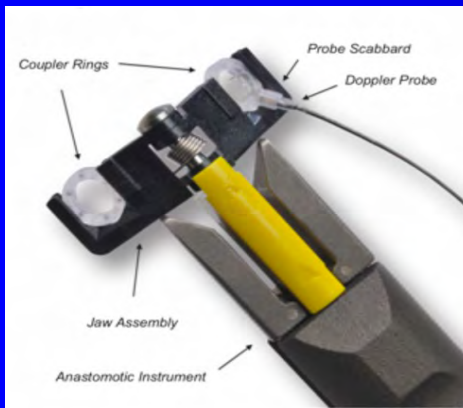
Intra-Operative revisions



Conclusions

- Doppler may shift detection to operating room
- Issue in the operating room may mean issue post op

Venous Flow Coupler



Flow Coupler: Recent Literature

120 Patients with Flow couplers and Cook Schwartz doppler

Takeback 9.2% (11/120)

- 10 venous thrombosis
- 1 Arterial thrombosis

Salvage Rate 81.8%

Flow:

- Sensitivity: 100%
- Specificity: 86.4%
- FPR 13.6%

Arterial Doppler:

- Sensitivity: 9.1%
- Specificity: 97.1%
- FPR: 2.9%

Rance et al. Outcomes and reliability of the flow coupler in postoperative monitoring of head and neck free flaps.
Laryngoscopy. 2018; 148(4): 812-817

Cases

510 Flaps

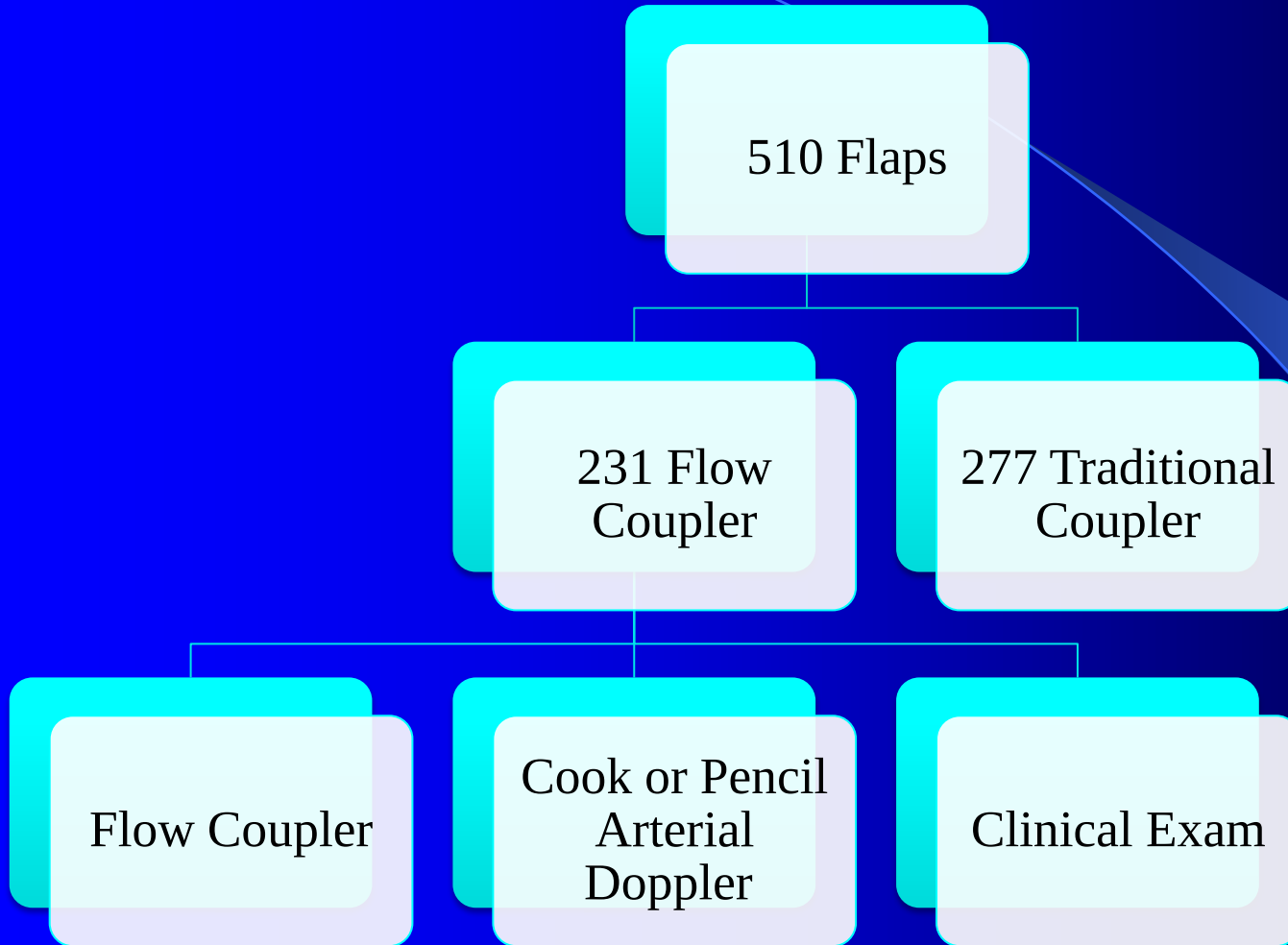
231 Flow
Coupler

277 Traditional
Coupler

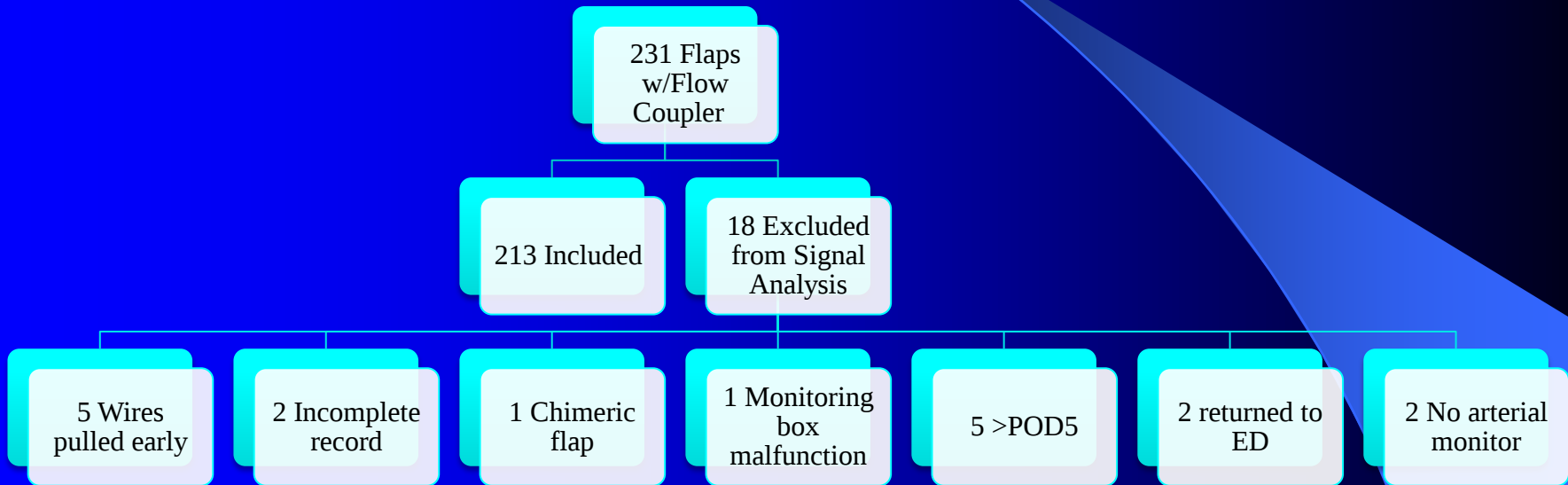
Flow Coupler

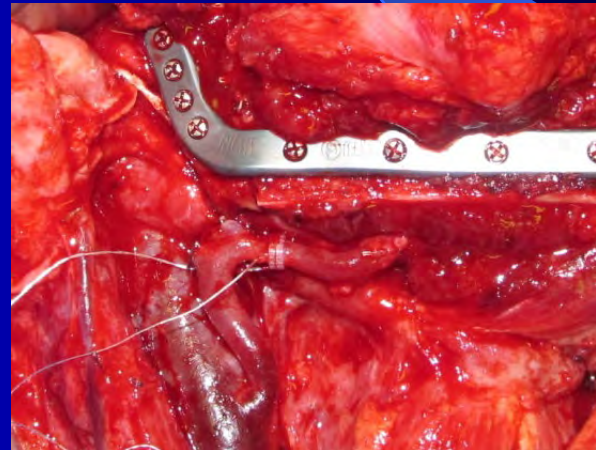
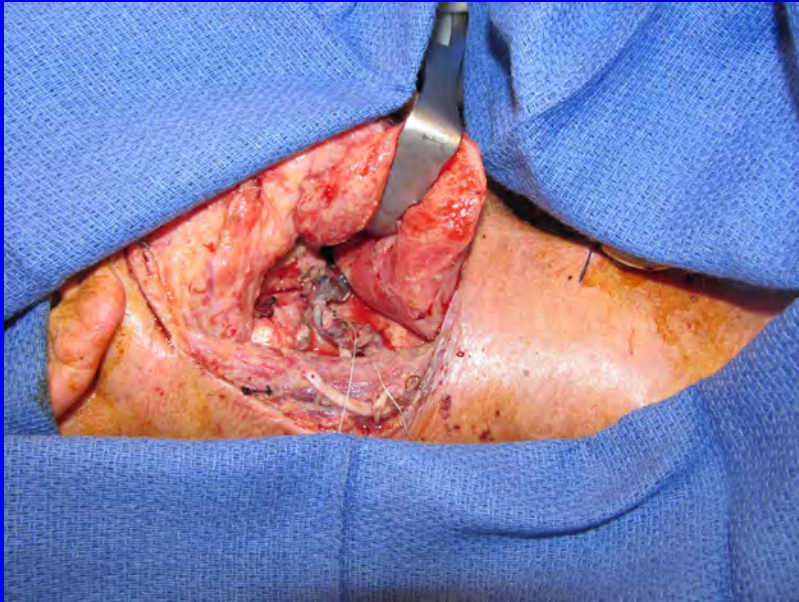
Cook or Pencil
Arterial
Doppler

Clinical Exam



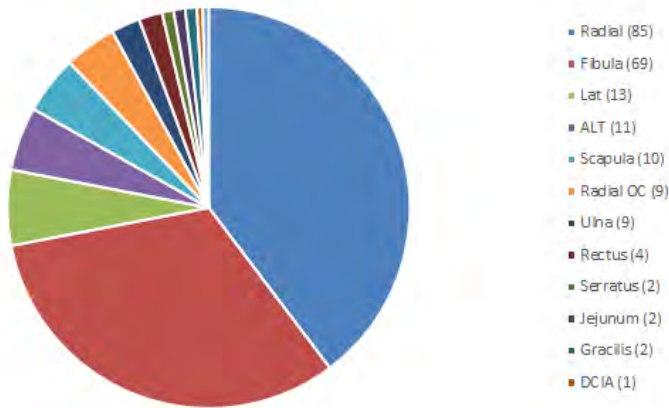
Signal Analysis: Cases Excluded



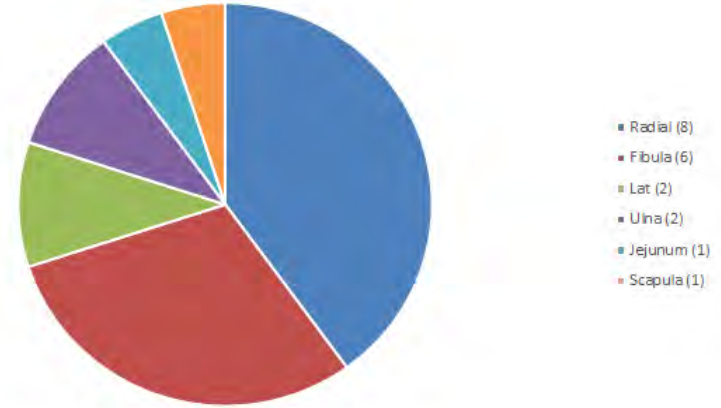


Analysis of Flaps Used

Free Flaps Used



Flaps Taken Back

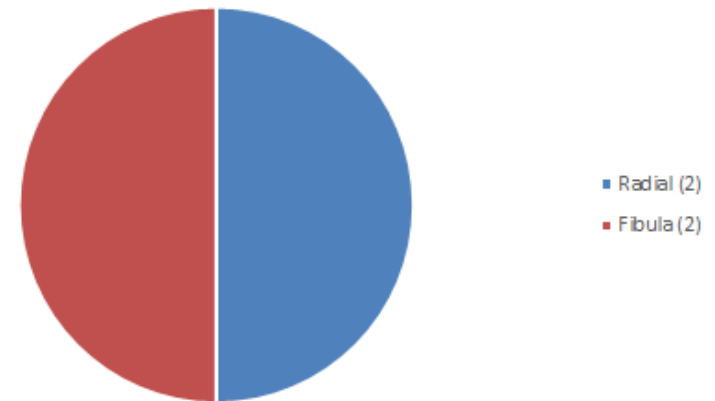


Takeback Rate
8.7% (20/231)

Flap Salvage
80% 16/20

Acute Flap Loss Rate
1.7% (4/231)

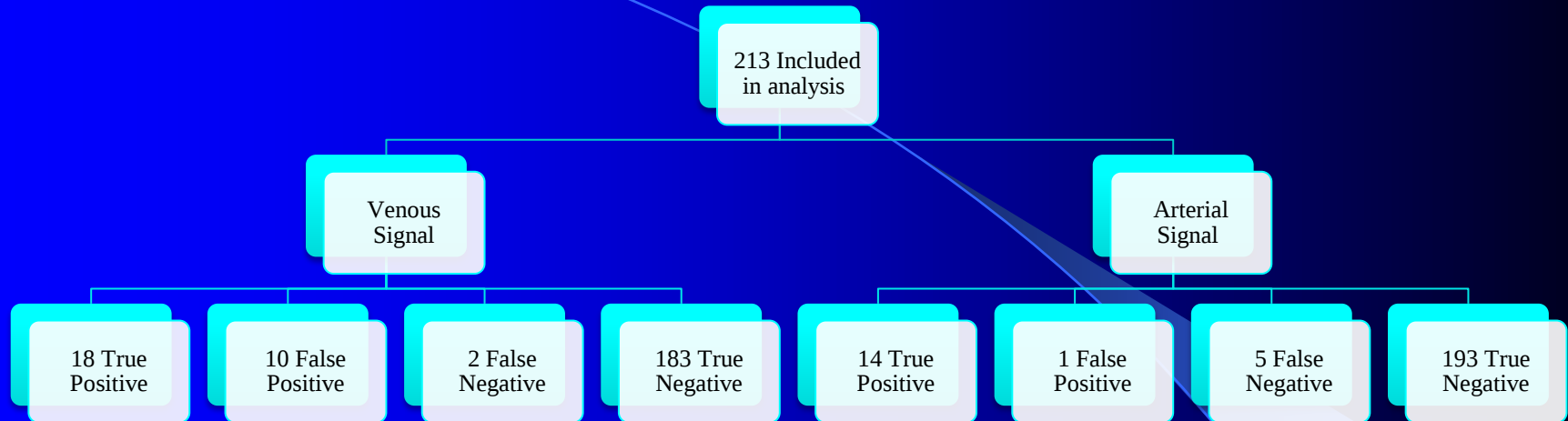
Dead Flaps



Operative Takeback Findings

Finding	Flow Coupler Signal	Arterial Signal
Not Recorded	Absent	Absent
A/V Thrombus	Absent	Absent
Venous Thrombus	Absent	Present
Arterial Thrombus	Absent	Absent
Venous Thrombus	Absent	Absent
Venous Thrombus	Absent	Weak
Arterial Thrombus	Absent	Absent
Arterial Thrombus	Absent	Absent
Vein Thrombus	Absent	Absent
Arterial Thrombus	Absent	Absent
Vein Thrombus	Absent	Present
A/V Thrombus	Absent	Absent
Dead	Present	Present
Venous Thrombus	Absent	Present
Dead	Absent	Absent
A/V Thrombus	Absent	Absent
Artery Thrombus	Present	Absent
Dead	Absent	Absent
A/V Thrombus	Absent	Absent
Dead	Absent	Absent

Accuracy of Total Signal Loss



Venous Flow Coupler

- PPV Signal loss: 64.3%
- NPV Stable signal: 94.8%
- Sensitivity: 90%
- Specificity: 94.8%
- FPR: 5.2%

Arterial Doppler

- PPV Signal loss: 93.3%
- NPV Stable signal: 99.5%
- Sensitivity: 73.7%
- Specificity: 99.9%
- FPR 0.1%

Ancillary Findings

- 24.1% (7/29) of cases where 2x flow couplers were used had 1 loose signal and the flap was never taken back.
- 3.4% (1/29) were taken back after the second flow went silent with intra-op finding of venous thrombosis

Conclusions

Flow Couplers identified compromised flaps before arterial signal
30% (6/20)

83.5% (5/6) Salvage rate

Use of flow coupler alone insufficient to positively predict flap

- Flow FPR 5.8% compared to Arterial FPR 0.1%
- 5.8% compared to 0.1% was lower in our study compared to the literature (5.8% compared to 13.6%)

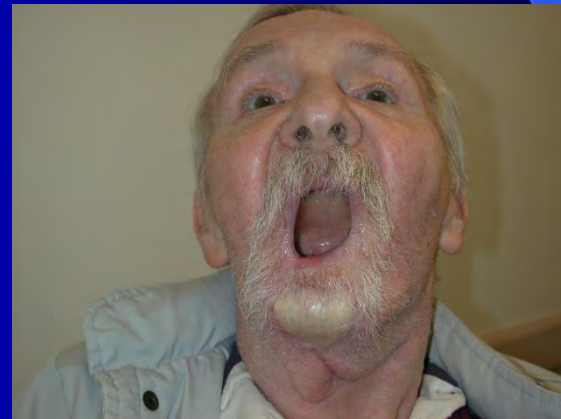
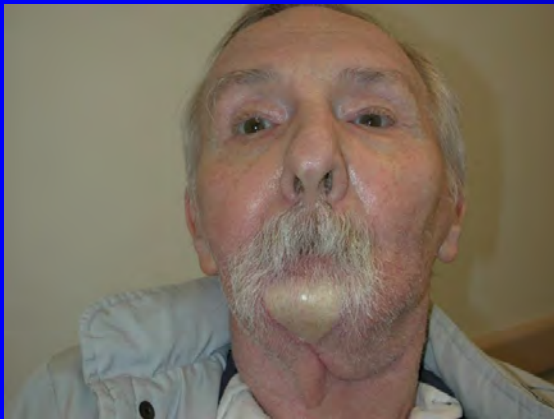
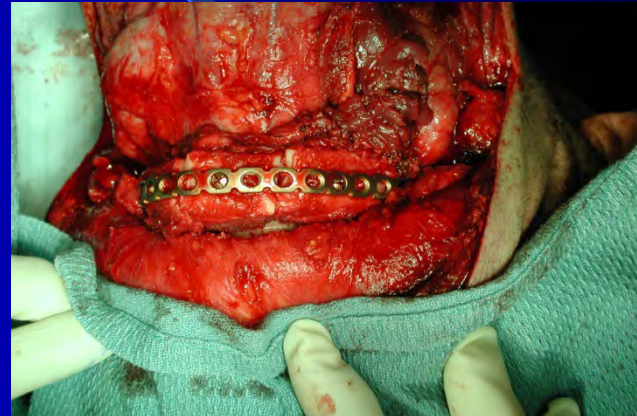
Together, Arterial Doppler and Venous Flow Coupler predict flap compromise.

- 95% identified (19/20)
- No unnecessary take backs

Recommend against using multiple Flow Couplers in a single flap

- 24.1% associated with a non-significant loss of signal
- Only 1.4% picking up a clinically significant change

All My Flaps Look Like This



Horror Upon Horror

- When do you stop and admit flap is dead
 - Intra Op
 - When do you toss the flap
 - Post Op
 - When do you pray
- When do you wait



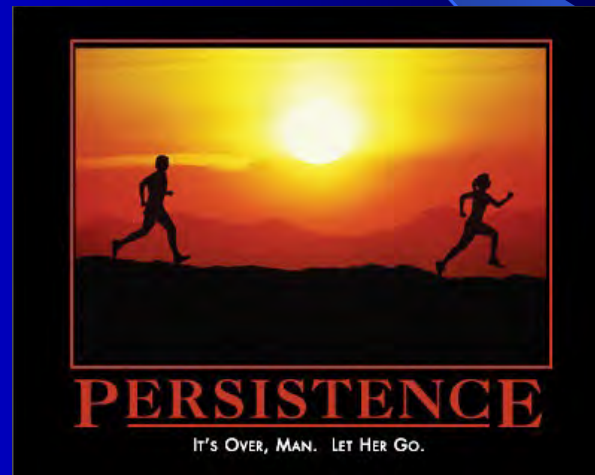
When is it Time To Call it a Day?

- Hmmmmm there is no perforator....
- I've been sewing and sewing and sewing

Intra Operative: Toss The Flap

When do you give up

- Multi Institutional
 - 7423 flaps
 - 46 intra op loss
 - Half anastomotic
 - 23 (.3%) perforators
 - That's every 333 flaps
- Go to second choice



Tossing The Flap

- Institutions

- OHSU
- WashU
- Fort Worth
- UAB
- MYSC
- Thomas Jefferson
- U of Kentucky

7,423 flaps

- 46 Intra-op tossed

- 35 total
 - 15 ALT
 - 7 Fibula
 - 4 Radial forearm
 - 4 Lat dorsi
 - 5 Other
- 11 partial (skin paddle)
 - 3 ALT
 - 8 Fibula

Tossed Flaps

- 46 Intra-op tossed
 - 35 total
 - 15 ALT
 - 7 Fibula
 - 4 Radial forearm
 - 4 Lat dorsi
 - 5 Other
- Etiology
 - 12 Clotting
 - 11 Perforator
 - 8 spasm/intimal issue
 - 4 Karma
- Half detected at donor site
- Half in head and neck

Tossed Flaps

- 46 Intra-op tossed
 - 11 partial
 - 4 ALT
 - 7 Fibula
- ALT
 - 4 muscle
- Fibula
 - 4 radial forearm
 - 2 pec
 - 1 muscle

Tossed Flaps

- 46 flaps Management
 - 28 Second flap
 - 11 local tissue flaps
 - Scalp
 - 6 Regional flap
 - 1 Primary closure
- Bone with bone
- Scalp with rotation
- Oral cavity pec flap

Incidence of Inadequate Perforators and Salvage Options for Anterior Lateral Thigh Flaps (ALT): A Multi-Institutional Retrospective Review of Over 1000 Flaps.



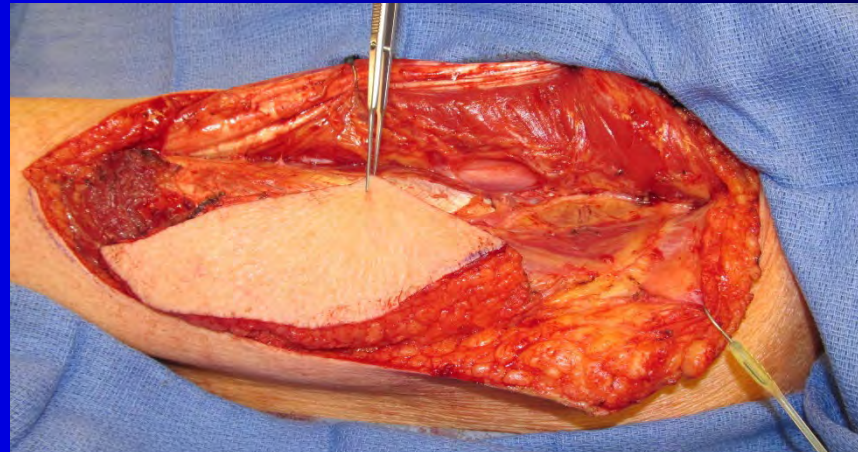
Haley E Calcagno MS¹, W. Walsh Thomas MD¹, Brett A Miles DDS MD², Steven B Cannady MD³, Matthew M Hanasono MD⁴, Mark K Wax MD¹.

¹Oregon Health & Science University, Portland, OR; ²Mount Sinai, New York, NY;

³University of Pennsylvania, Philadelphia, PA; ⁴University of Texas-MD Anderson, Houston, TX

The ALT Flap in H&N Reconstruction

- ALT flap is a popular option for soft tissue reconstruction
- Variability of dominant ALT flap blood supply
 - Inadequate perforators range from <1% to 5.5%.



Study Design

- Multi-institutional retrospective review of head & neck reconstruction with ALT free flaps (2000-2018)
- Review of patients with non-viable primary ALT free flap
 - No bleeding of skin edges, no perforator identified, no perfusion on fluorescence perfusion imaging
- Exclusion criteria:
 - Intraoperative iatrogenic perforator injury
 - Problematic vessel anastomosis contributing to free flap failure
- Senior surgeons surveyed as to timing of inadequacy of ALT free flap
 - Early vs Late
 - Transition - Performance of posterior/lateral ALT incision to complete the skin incision
 - Alternative reconstructive techniques and flap survival reported.

Cohort & Results

- 1079 ALT free flaps harvested
- 28 Non-viable – 2.6%

Patient Demographics		
Age	58.5 years	
Gender	20 (71%) Male	8 (29%)
Laterality of ALT	15 (54%) Left	13 (46%)

- Bilateral absence of ALT perforators – 2 patients
 - No uniform protocol to explore opposite side

Surgical Demographics

Timing	12 (43%) Early	16 (57%) Late
Salvage Site	12 (34%) Existing Site	23 (66%) New Donor Site*

* - 6 Patients underwent further reconstruction for flap loss

Salvage Flaps

Same Initial Incision: 34%

<u>Flap Type</u>	<u>#</u>
Anteromedial thigh	7
Vastus lateralis	3
Rectus femoris	1
Tensor fascia lata	1

New Operative Donor Site: 66%

<u>Flap Type</u>	<u>#</u>
Radial forearm	6
Contralateral ALT	5
Rectus abdominus	4
Profunda artery perforator flap	3
Pectoralis major	2
Contralateral Tensor fascia	1
Fibula	1
Cervicofacial rotation	1

Table 1a&b. Salvage flap harvest site after non-viable primary ALT flap.

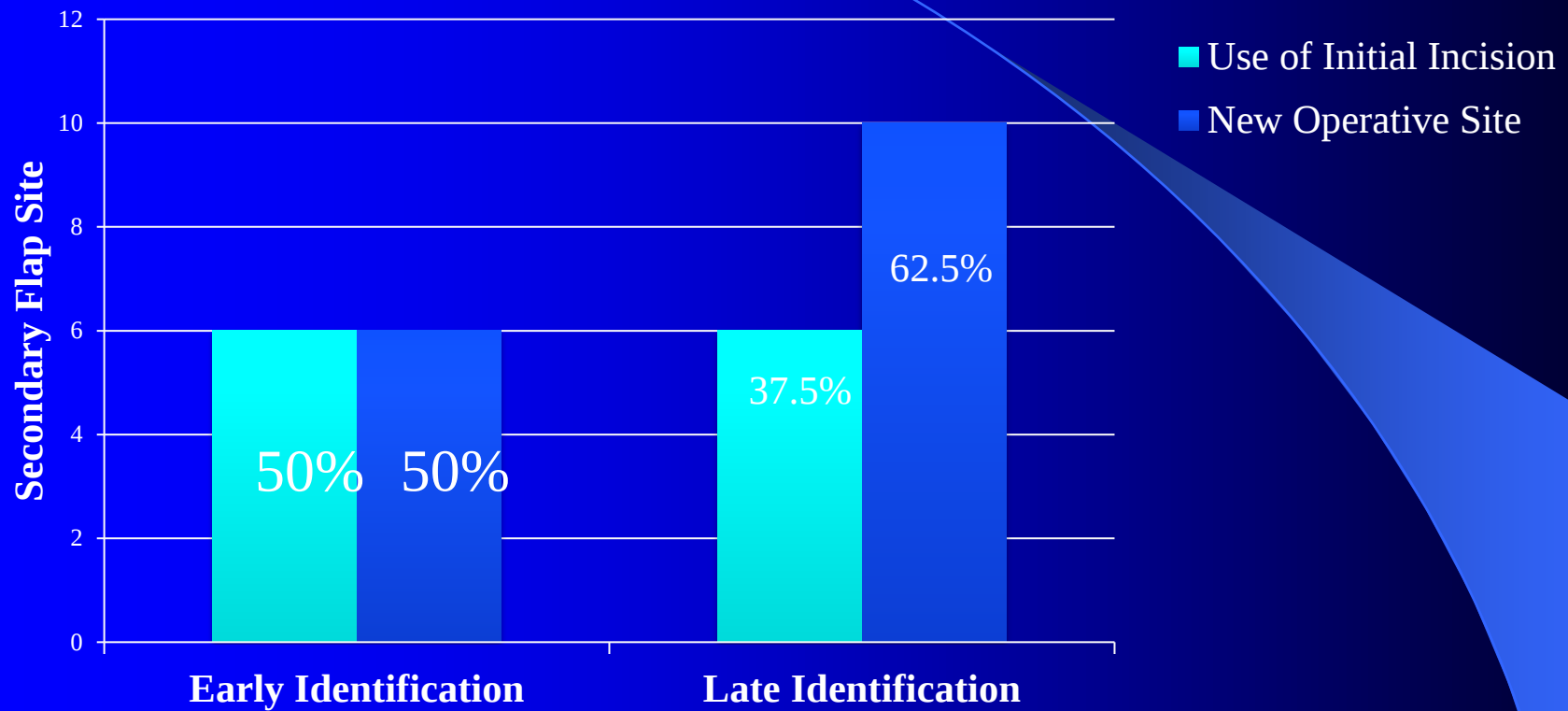
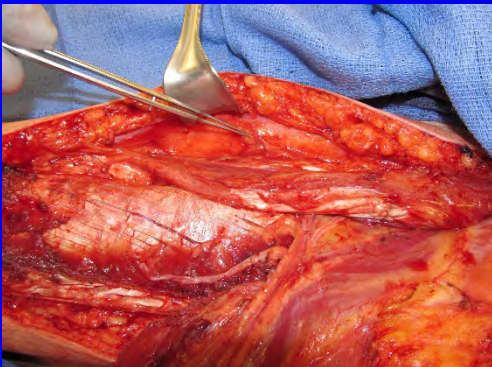


Figure 2. Impact of early and late identification of non-viable ALT flap on salvage flap harvest site.

Discussion

- Constraints of the defect & timing of identification of non-viable ALT dictate optimal alternative flap
 - What is your next Best choice.
 - Early vs late identification of perforator adequacy impacts salvage options
- Anteromedial thigh flap
 - Reciprocal dominance⁶
 - De-novo non-usability 49%⁹



Cutaneous perforator from rectus femoris branch of dLCFA



Continuation of RF branch of dLCFA

Discussion

- **Rectus Femoris, Vastus Lateralis, Tensor fascia lata flaps**
 - Vascularized myofascial flaps
- **Transverse branch**
 - Short pedicle
 - Transverse branch of lateral circumflex femoral artery may be source of ALT cutaneous perforators in 4-35% of thighs¹⁰
- **Profunda Artery Peforator flap** –
 - Confines donor site to ipsilateral thigh
 - Initial uses in H&N reconstruction as primary flap.¹¹
- No routine use of fluorescent imaging technology or Doppler ultrasound
 - Across all 4 institutions

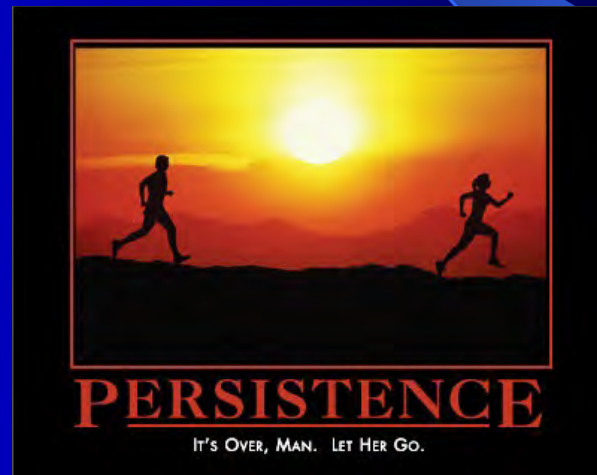
Conclusion

- Use your next best option to reconstruct the defect for these rare events
 - Defect constraints dictate available options
 - Early identification of a non-viable ALT free flap allows for many options for salvage with comparable flap characteristics and minimal additional morbidity.

Intra Operative Anastomosis WAH

When do you give up

- Genden/Cannady/Curry/Rosenthal
 - Pick a number
 - Pick a time
- Do a second flap



Flap May Live.....

- Trouble with anastomosis
- It's a revision
- Great inflow
 - Sucky outflow
- Flap still blueish
- Maybe it 3 or 4 am
- Let it be
 - Go home
 - Sleep
 - Plan number 2
- Living on hope
 - How often.....
 - Couple times a year



This flap was alive yesterday..

- This is a biologic dressing
 - Intra oral good 5-7 days
- Now we can stabilize
- Now we can plan
- Can schedule



What is the Cost of Leaving a Dead Flap

- Boney Flap
 - Needs another boney flap
 - Come back in a few days
- Is it just the skin???
- Pt is better if they have a few days





ACHIEVEMENT

YOU CAN DO ANYTHING YOU SET YOUR MIND TO WHEN YOU HAVE VISION,
DETERMINATION, AND AN ENDLESS SUPPLY OF EXPENDABLE LABOR.

Flap Compromise & Salvage

Detection Post Op

- Critical on many fronts
- Early is best?
- Who detects?
- What do you do?
- Retrospective review
- 2010-2023
- 1959 flaps
- 173 flaps (8.8%)
 - 131 to OR (6.6%)
 - 61% Salvage
 - 42 Pronounced

Background

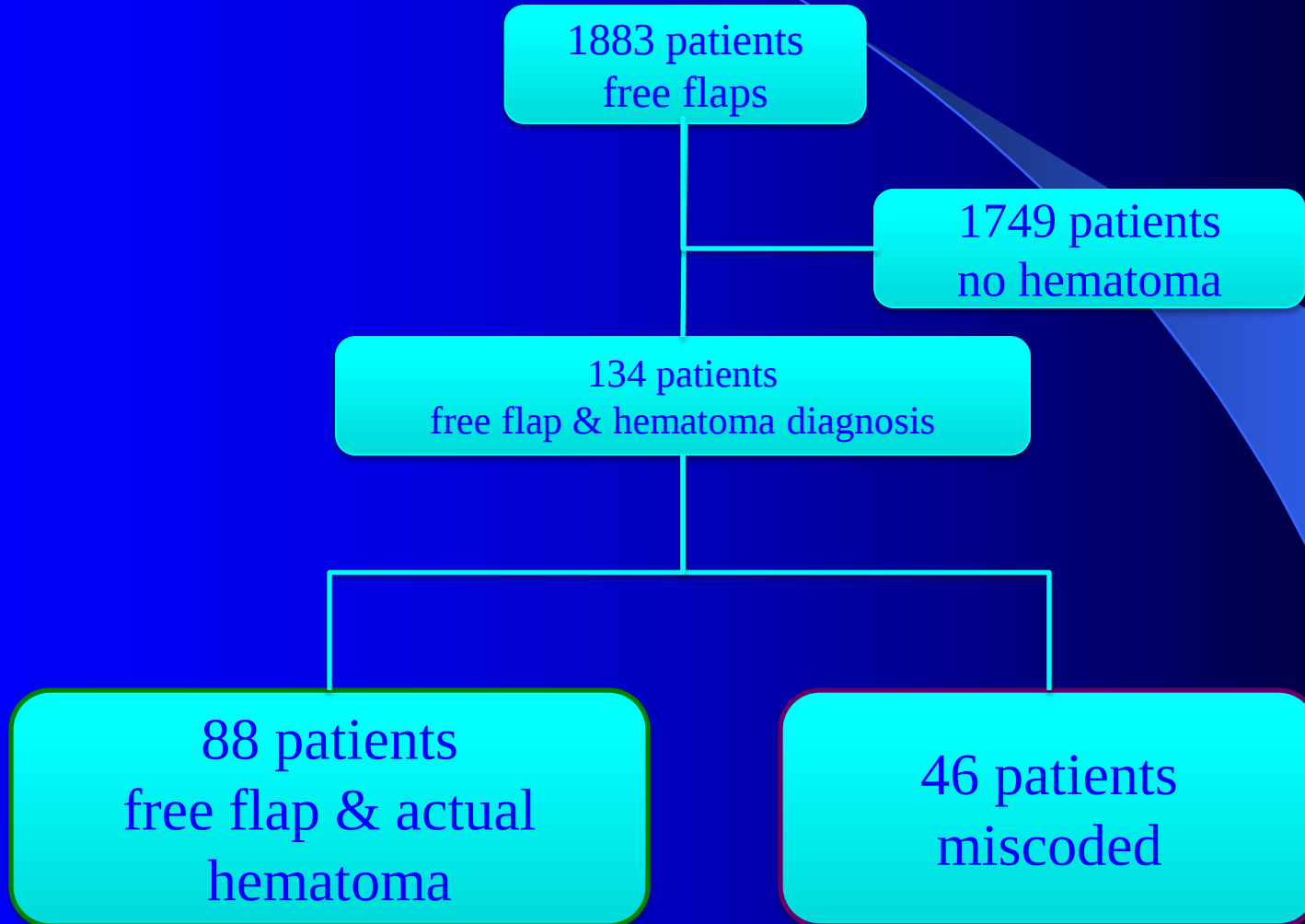
- Hematomas are a frequent cause of re-exploration after micro-vascular free flaps
- Thought to cause compression of pedicle with or without associated vascular thrombosis
 - Little clinical literature exists regarding the effect of hematomas on vascular pedicle



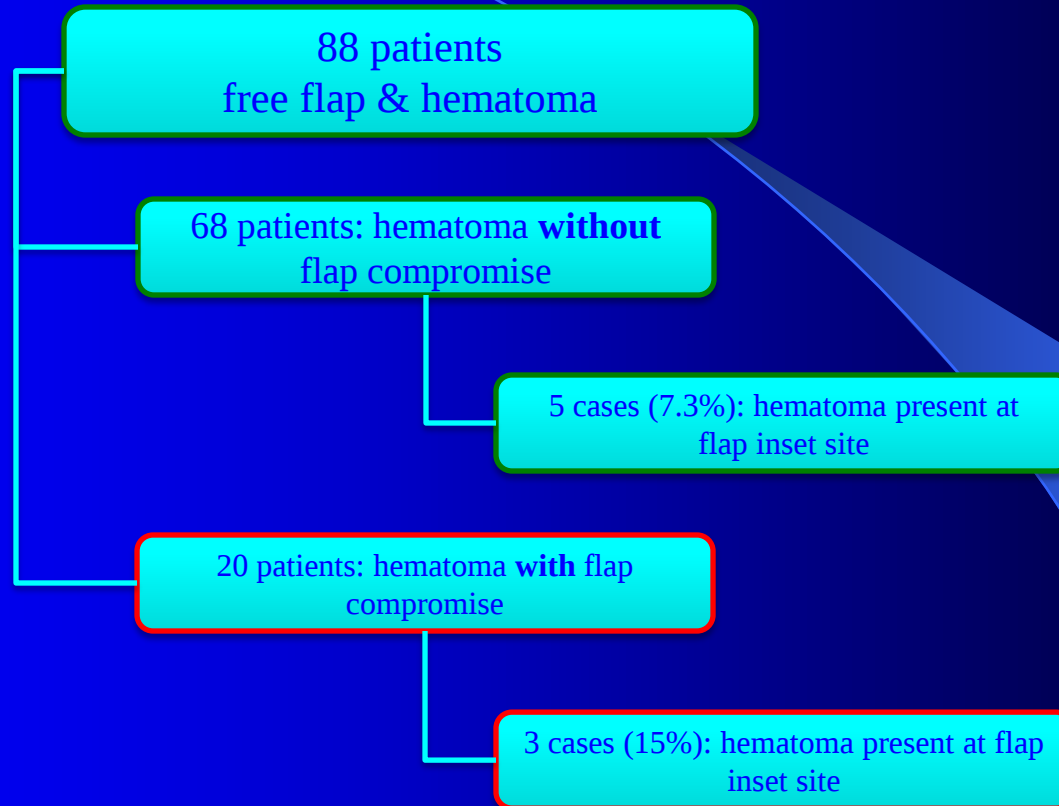
Study Design

- Retrospective chart review of all patients undergoing free tissue transfer for head and neck reconstruction
 - July 1998 to June 2014
 - All patients were from a single tertiary referral center
- Coding database was queried for all ICD-9 diagnoses associated with hematomas
- Free tissue transfer and hematoma lists were cross-referenced for matches

Patients



Results



- Remainder of cases: hematoma found near pedicle anastomosis

Results

Hematomas with Flap Compromise

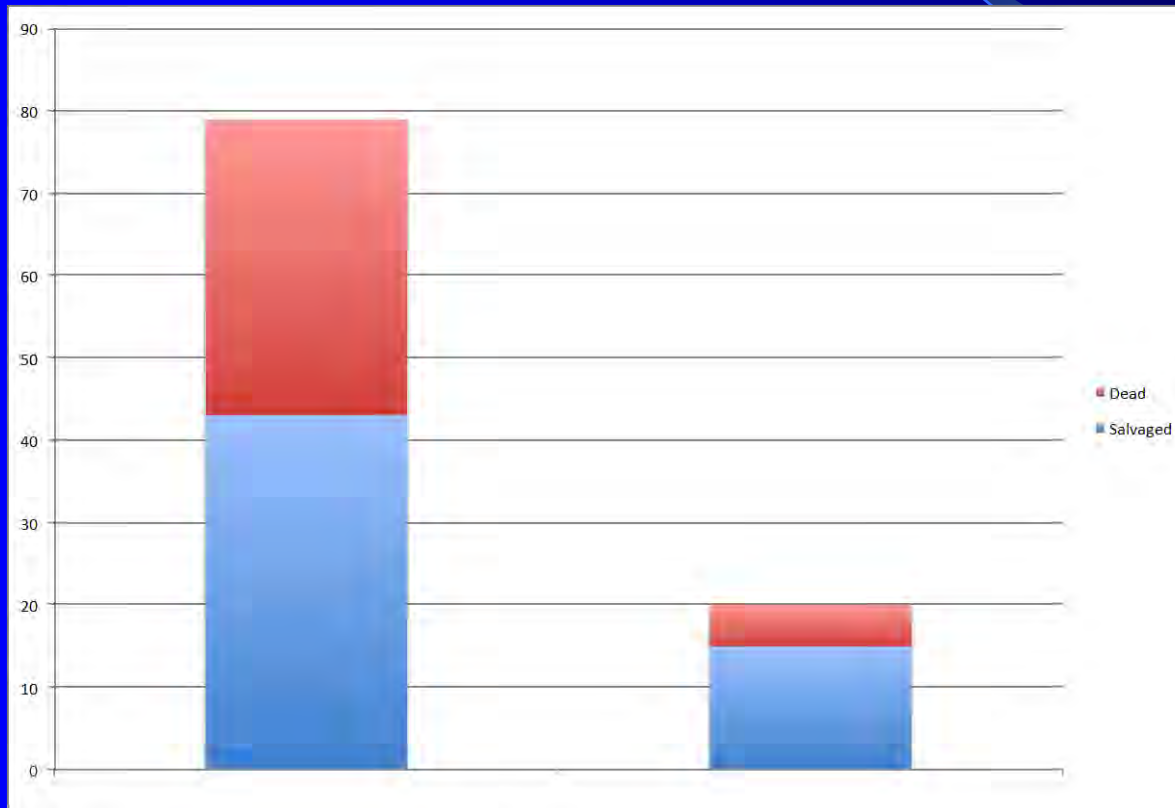
- Salvage rate: 75%
- 5 out of 20 flaps could not be salvaged

Flaps Compared

Results

Flap Compromise from Other Causes

Flap Compromise from Hematomas



Flaps
Salvaged

- Flap salvage rate from hematomas: 75% versus 54% for other causes ($p = 0.12$)

Results

Time to Detection

- Salvageable: 35.3 hrs
(3 – 139 hrs)
- Unsalvageable: 91.6 hrs
(14 – 161 hrs)

Time to OR from Detection

- Salvageable: 2.8 hrs
(1 – 7 hrs)
- Unsalvageable: 12.4 hrs
(1 – 38 hrs)

❖ $p = 0.052$

Results

< 72 hours

> 72 hours

< 5 hours

> 5 hours

- Time to hematoma detection
 - < 72 hours: 90% salvage rate
 - > 72 hours: 71% salvage rate
 - ❖ $p = 0.07$
- Time to OR from detection
 - < 5 hours: 93.3% salvage rate
 - > 5 hours: 20% salvage rate
 - ❖ $p = 0.005$

Conclusions

- Incidence of hematomas 4.7%
 - Most hematomas occur adjacent to pedicle
- Compromise from hematomas: 25%
 - Higher rate of flap salvage after hematomas
 - Prompt return to OR is important for flap salvage
 - Presence of vascular thrombosis portends a poor prognosis

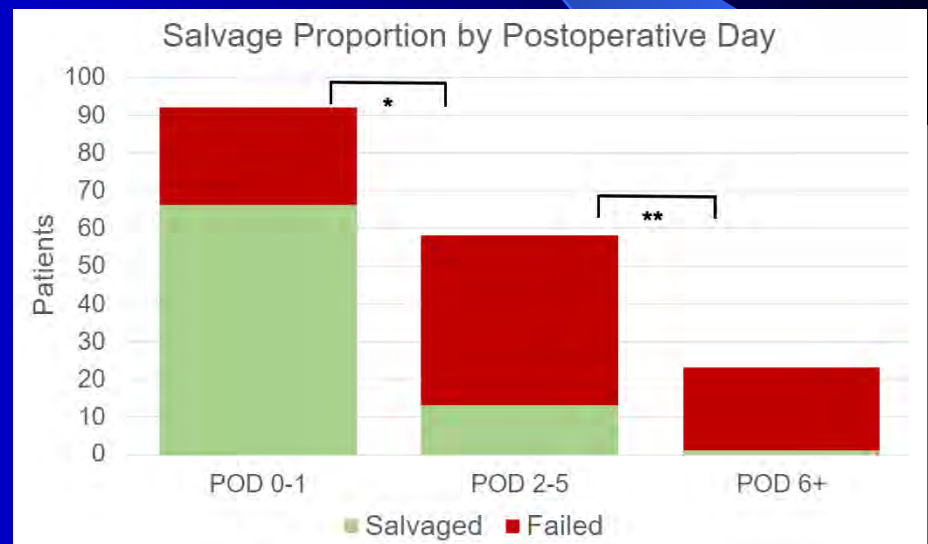
Flap Compromise & Salvage

Detection Post Op

- Why does time matter
 - Sells to residents
 - Tid flap checks
 - Sells to nurses
 - Q1
 - Sells to Operating room
 - Time to get back

*(66/92) vs. (13/58), (OR=8.64, $p<0.0001$)

** (13/58) vs (1/23), (OR=6.36, $p=0.045$)



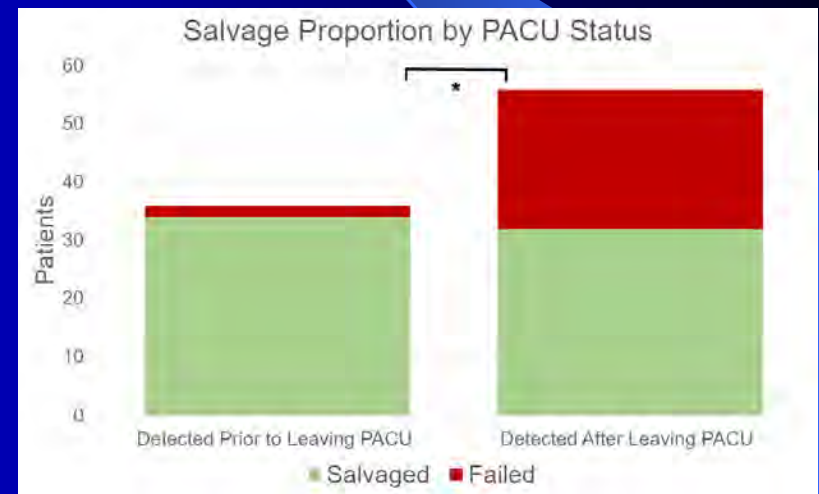
Flap Compromise & Salvage

Detection Post Op

- PACU

- Doppler runs continuous
- Gets buy in
- I can find the patient
- We get back to the OR FAST

*(34/36) vs. (32/56), (OR=12.75, $p<0.0001$)

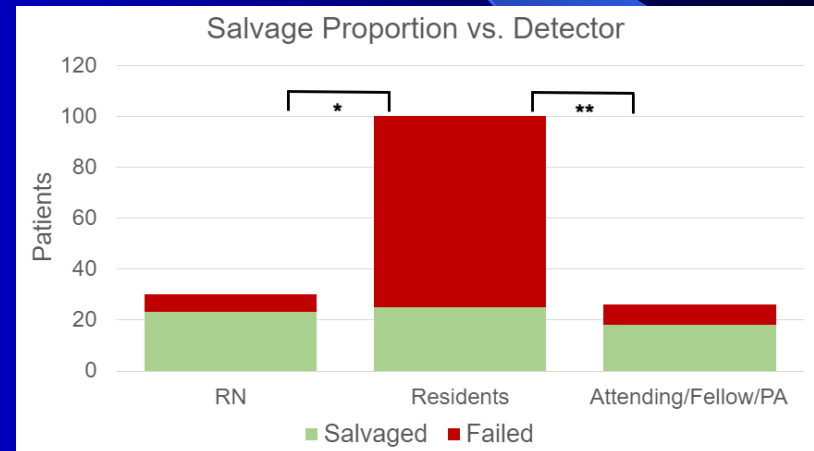


Flap Compromise & Salvage

- Detection by who???
- Nurses do great
 - 77% salvage
 - Sells big time
- Residents suck
 - 25% salvage
 - Okay
- Fellows/Attendings
 - We get the one offs
 - Second check
 - They look funny

*(23/30) vs. (25/75), (OR=9.86, $p<0.0001$)

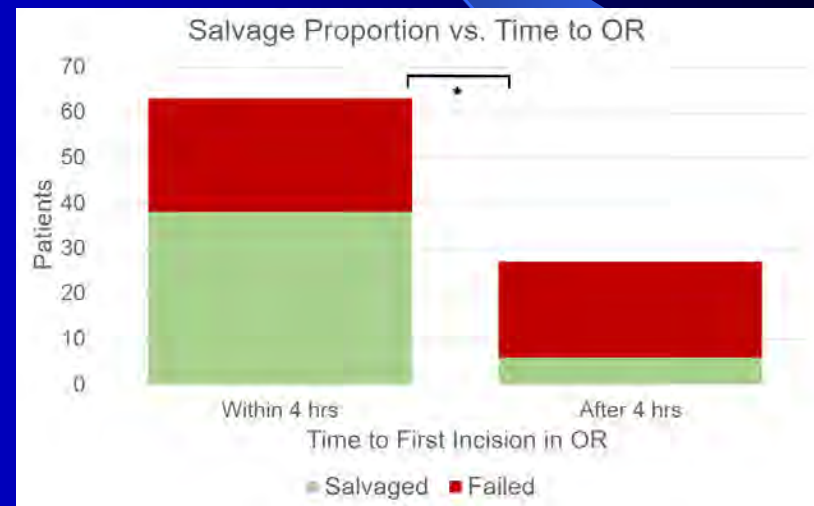
** (18/26) vs. (25/75), (OR=6.75, $p<0.0001$)



Flap Compromise & Salvage

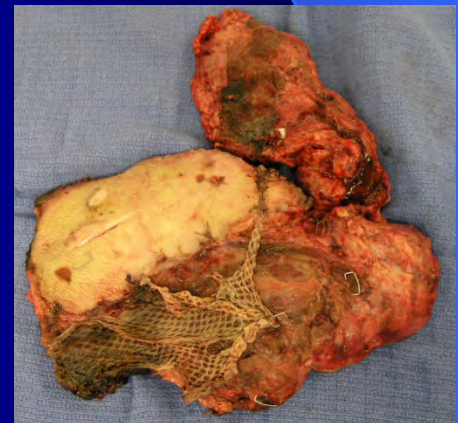
- Return to the OR
- Does speed matter
- Sells the OR
- Sells Anesthesia

*(38/63) vs. (6/27), (OR=5.32, p=0.0009)



What are the outcomes for free flaps undergoing second revascularization attempts?

- Incidence of perioperative free flap compromise is low
 - 10-15%
- Initial flap salvage rates
- 60-80%
- Outcomes of second episodes of compromise
 - ?????



Multi-institutional retrospective study

- Flaps initial compromise and successful revascularization
..... second compromise
- **Objective:** assess the outcomes
- **Design:** 6 institutions, 2000-2020

Variables

- Cause of second episode of compromise
- Heparin drips
- Salvage rates
- Management of flap death
- Post-operative complications



Multi-institutional retrospective study: results

- 3,510 Flaps
- 350 initial revisions:
- 79 second compromise

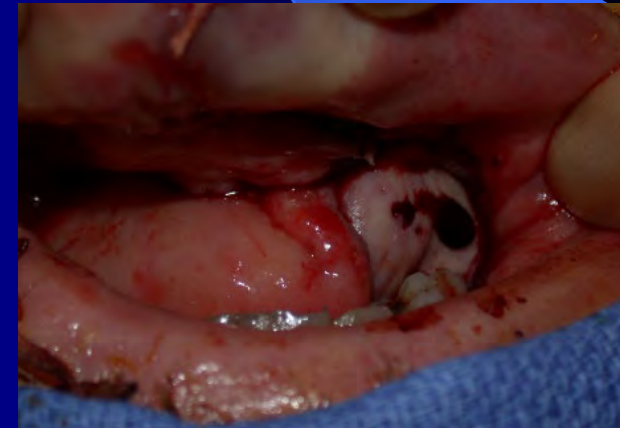


Multi-institutional retrospective study: results

Etiology

- Venous thrombosis 30%
- Arterial & venous thrombosis 30%
- Unknown causes 19%
- Arterial thrombosis 18%
- Infection 2.5%

Flap outcomes 30% survived



Multi-institutional retrospective study: results

Arterial or venous thrombectomy

- **Flaps survived:** 17/24 (71%)
- **Flaps with necrosis:** 23/55 (42%)

OR 3.38 (95% CI 1.21 to 9.47)

Vein revision to an alternative branch vein associated with flap necrosis:

- **Flaps survived:** 1/24 (5%)
- **Flaps with necrosis:** 19/55 (35%)

OR 0.13 (95% CI 0.01 to 1.2)

Multi-institutional retrospective study: results

Heparin drip, ptt goal 65

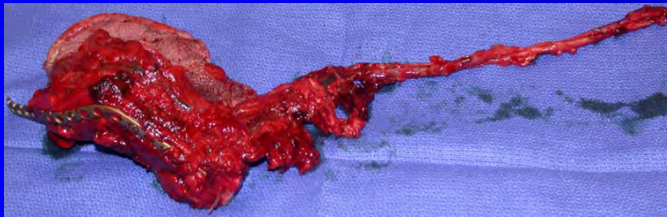
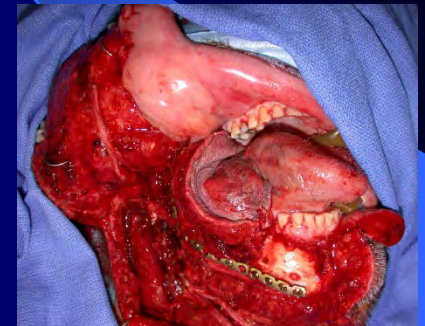
- Given to 30% following initial successful salvages

Second salvage

- Given to 54% following second salvage
 - No diff

Variables not associated with flap survival

- Patient demographics
- PMH, smoking, radiation
- Post-operative complications
- Head and neck cancer site
- Free flap type
- Reconstruction site



Multi-institutional retrospective study: results

Secondary reconstructions for flaps with necrosis

- Second free flaps 44%
- Regional flaps 38%
- Other 13%
- Conservative care 5%

Second salvage: discussion

Second salvage outcomes

- 30% salvaged
- Thrombectomy associated with successful revascularization
- Flap with history of arterial/venous thrombosis, second salvage has a greater likelihood of success
- Arterial thrombosis good prognostic indicator
- Generalized venous congestion poor prognostic indicator

Second salvage: Discussion

Consider second salvage:

- Preserve optimal reconstruction
- Flap is otherwise healthy aside from isolated thrombus
- Native anatomy provides vessels for revascularization

Salvage And The Art of Medicine

Flaps that did not survive initial salvage

- 80 flaps that did not survive initial salvage
- Unknown medical decision making
- Unknown management of reconstruction

Perks of Fellowship



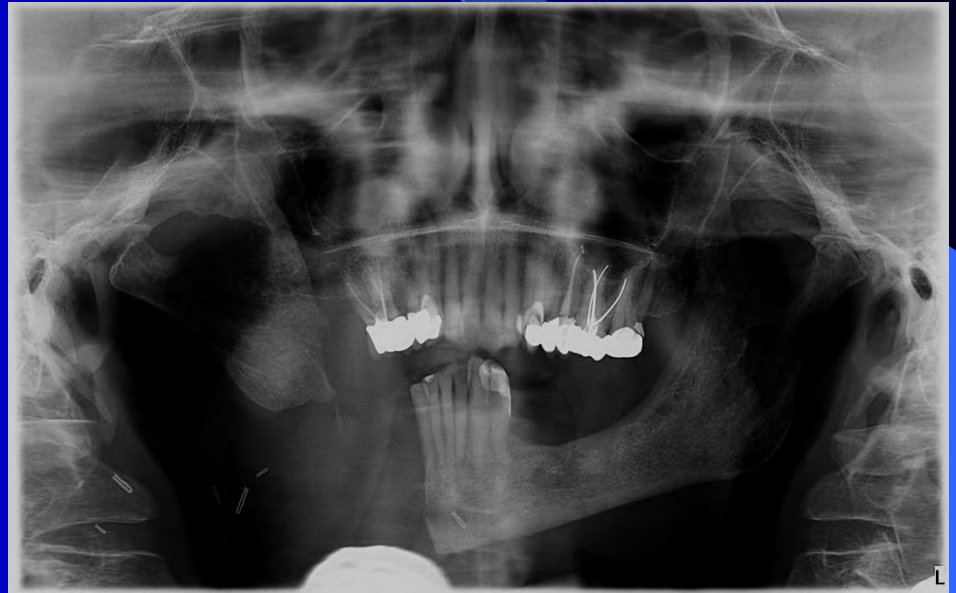
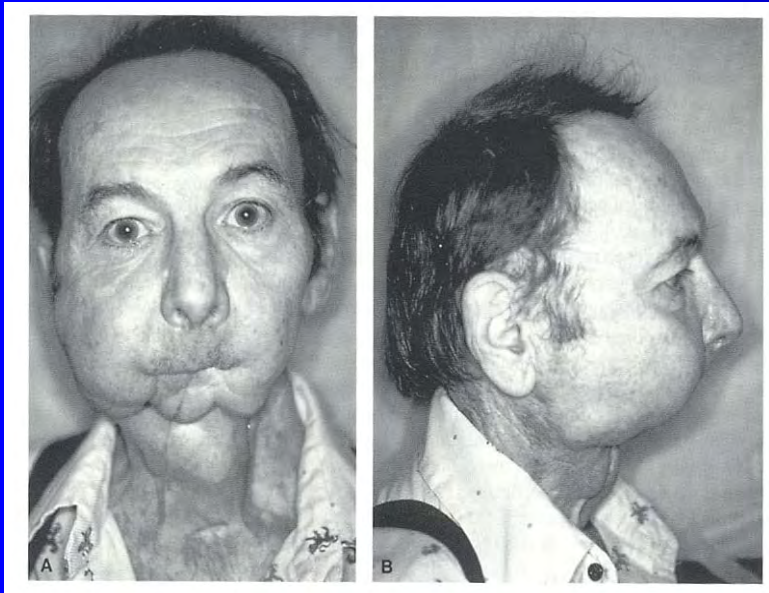
3-D Modeling and PSP Plates

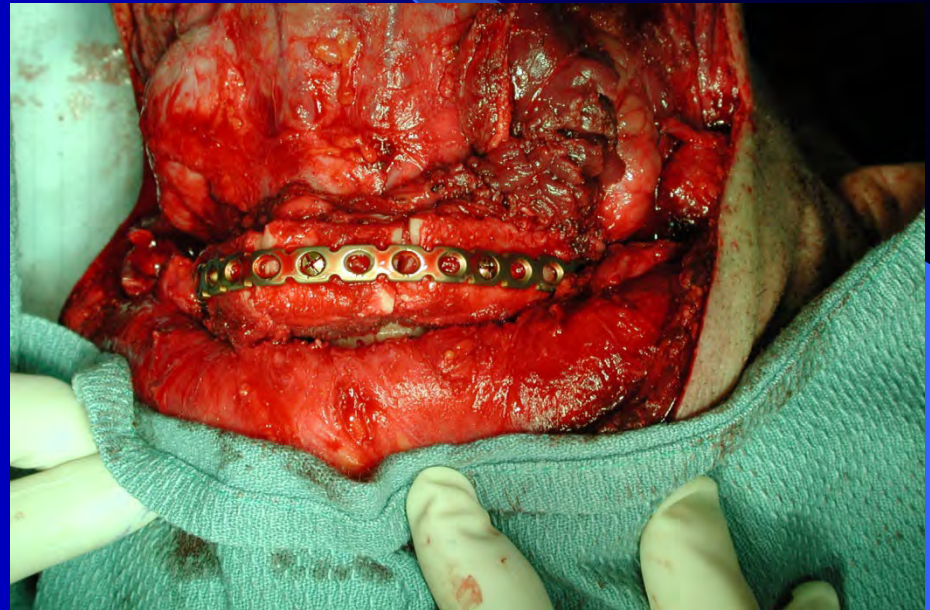
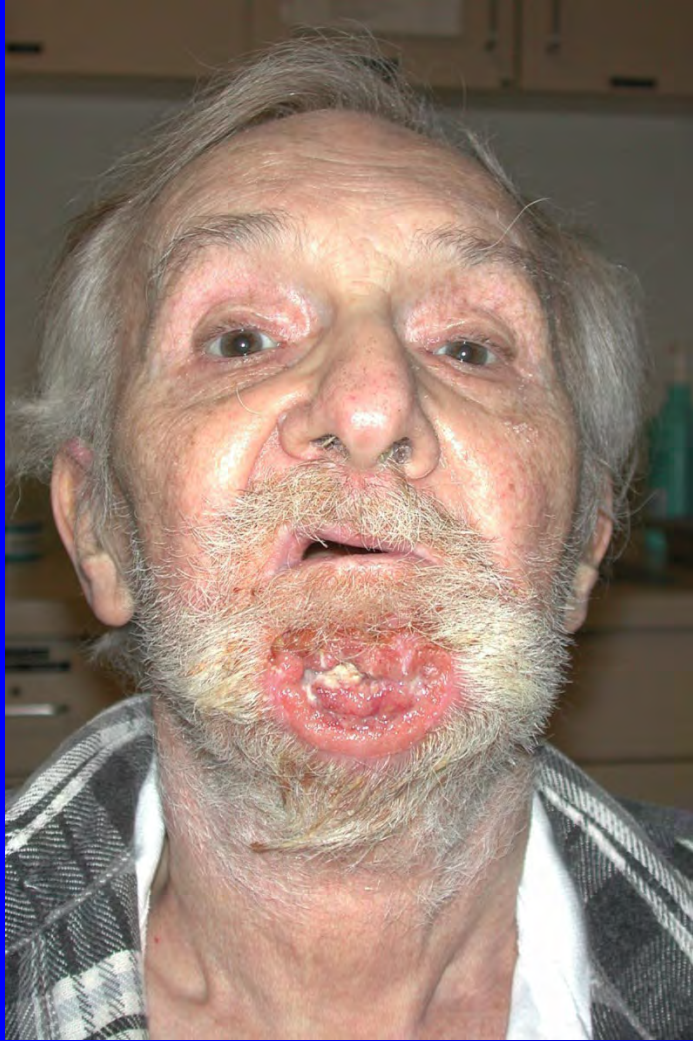
Oral Surgery

Recon Team

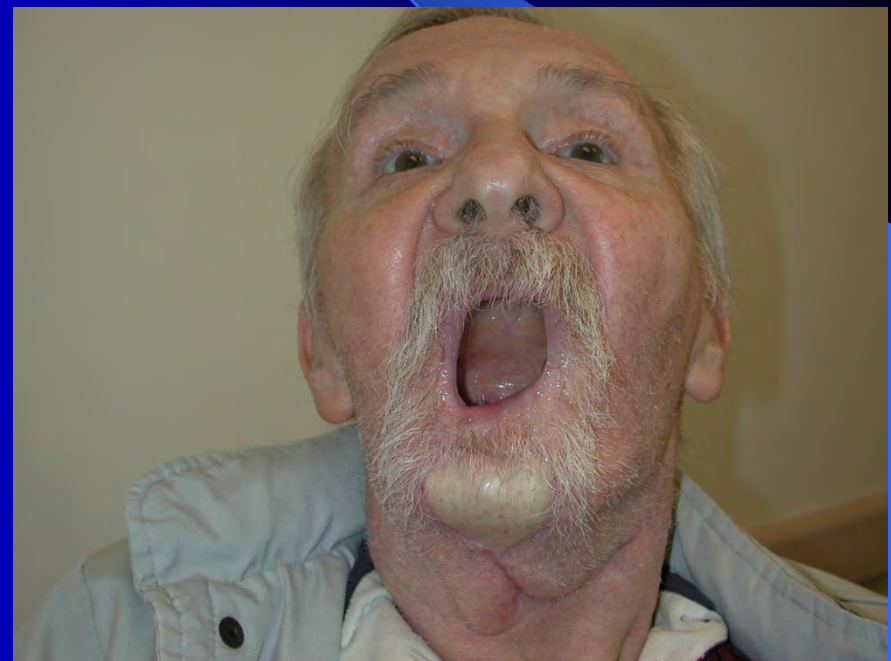
Lisa!!

Mandible Reconstruction: None





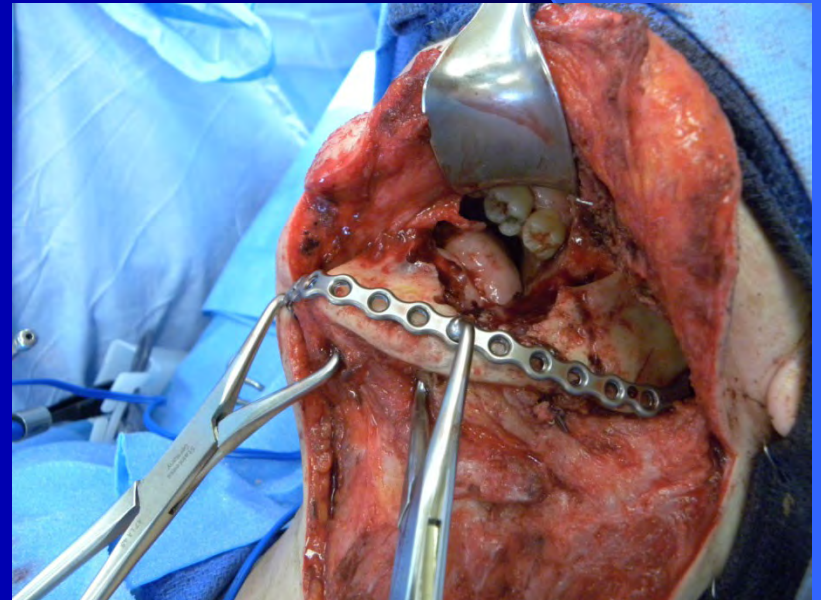
Fibula Flap Reconstruction





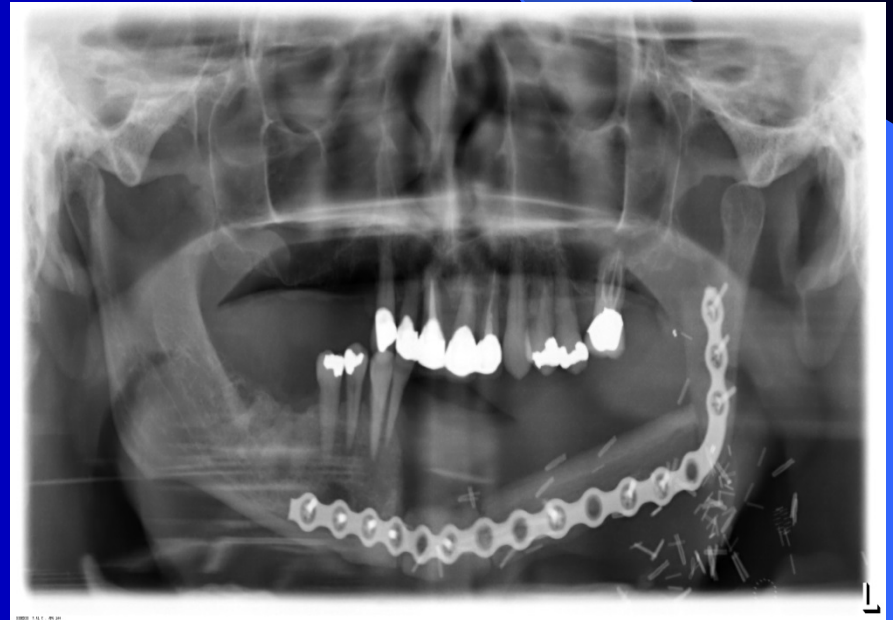
LIMITATIONS

UNTIL YOU SPREAD YOUR WINGS,
YOU'LL HAVE NO IDEA HOW FAR YOU CAN WALK.



Issues

- Hard to line up teeth
- Osteotomies are “art”
- Take a long time
- Plate has curve fibula does not
- No implants
- No teeth



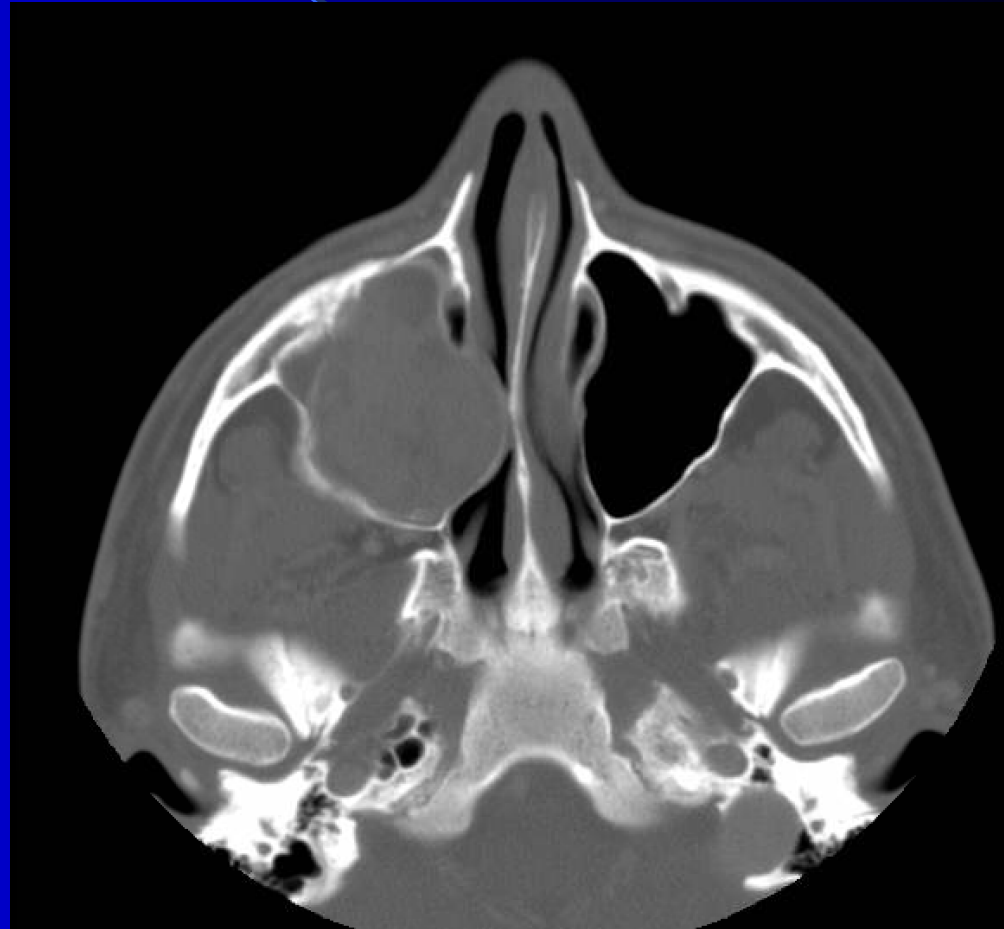
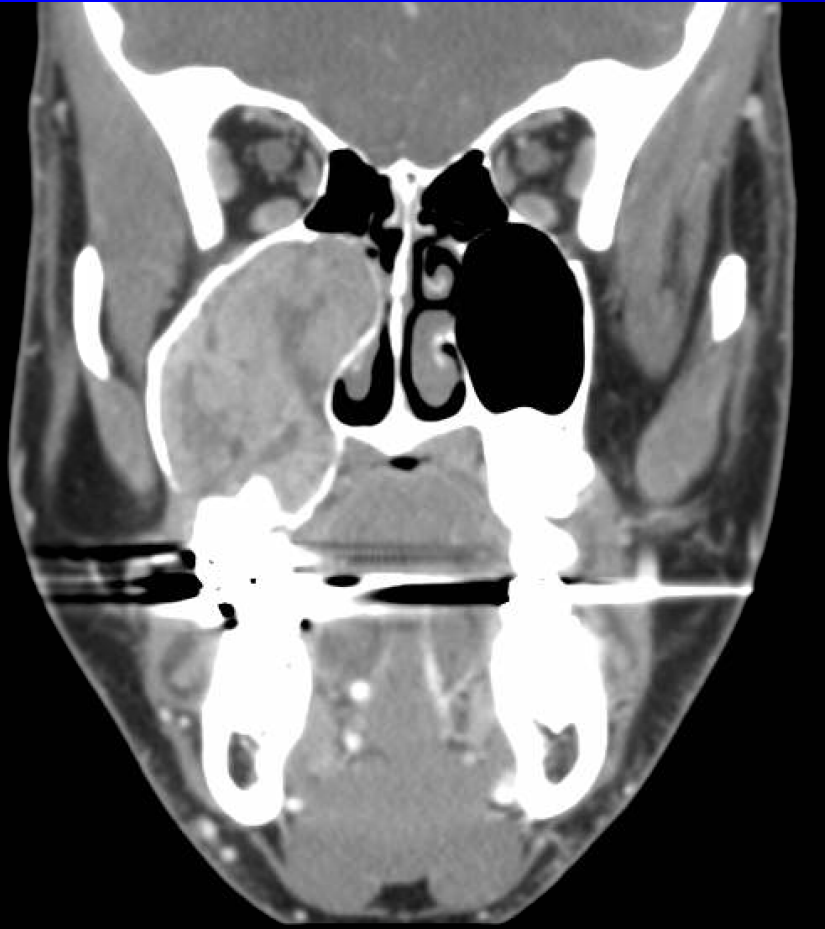
Oral Surgery

- Do we compete?
- Portland is unique
- They have cases
- They know teeth
- They know benign pathology
- 3D modeling
 - Evolution
 - PSP
 - 3D Printer in the OR

36 yr male, ameloblastoma right maxilla



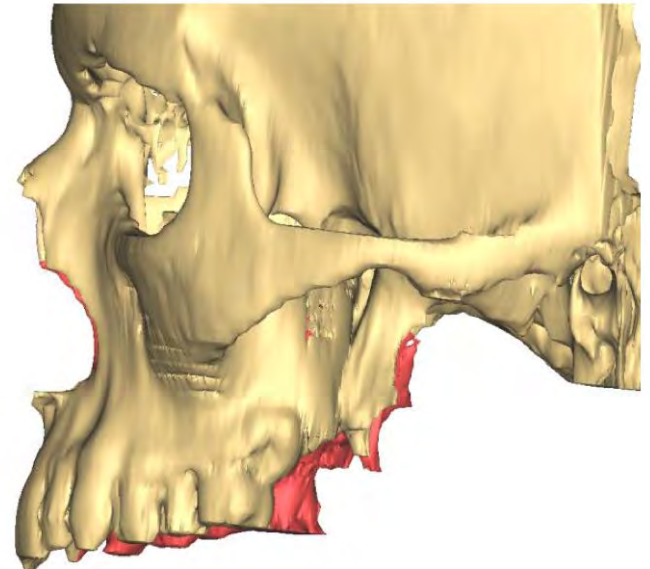
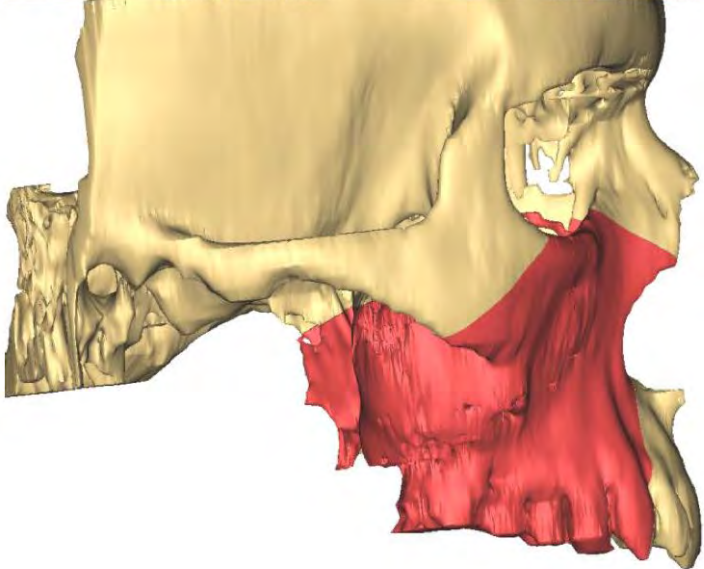
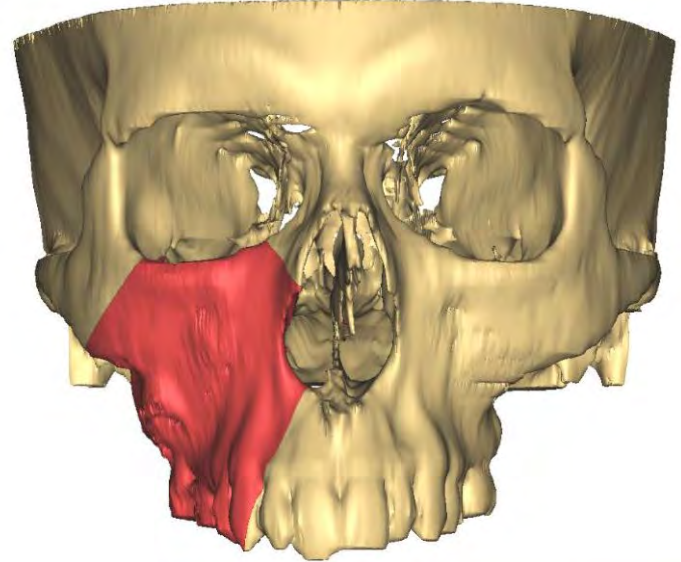
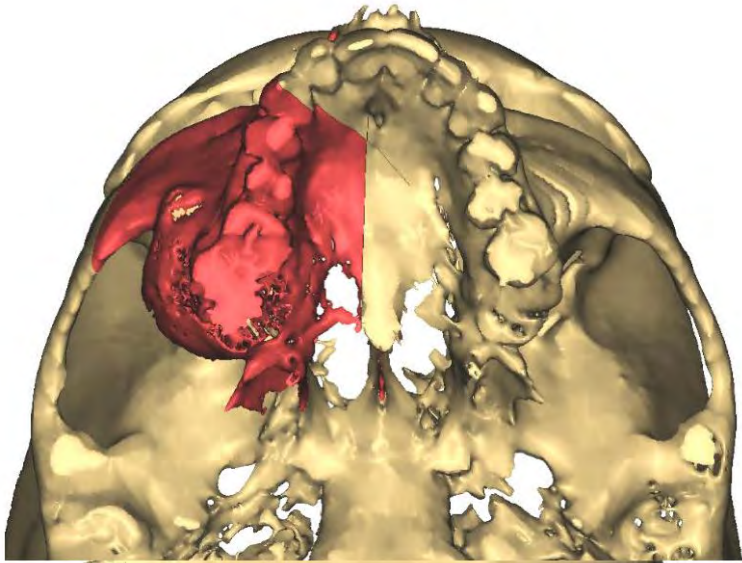
Preoperative CT



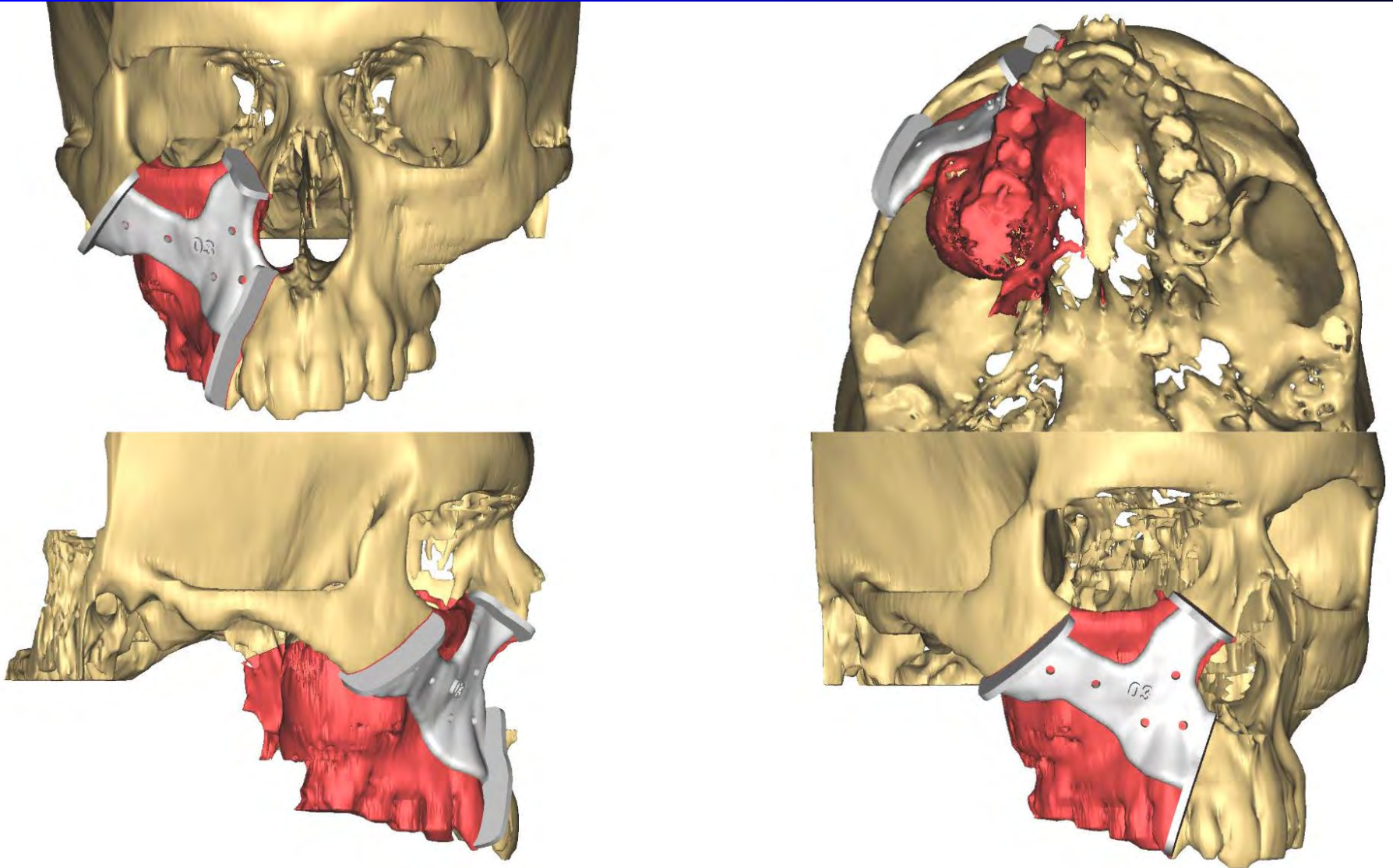
Hood To Coast: You Could Be Here



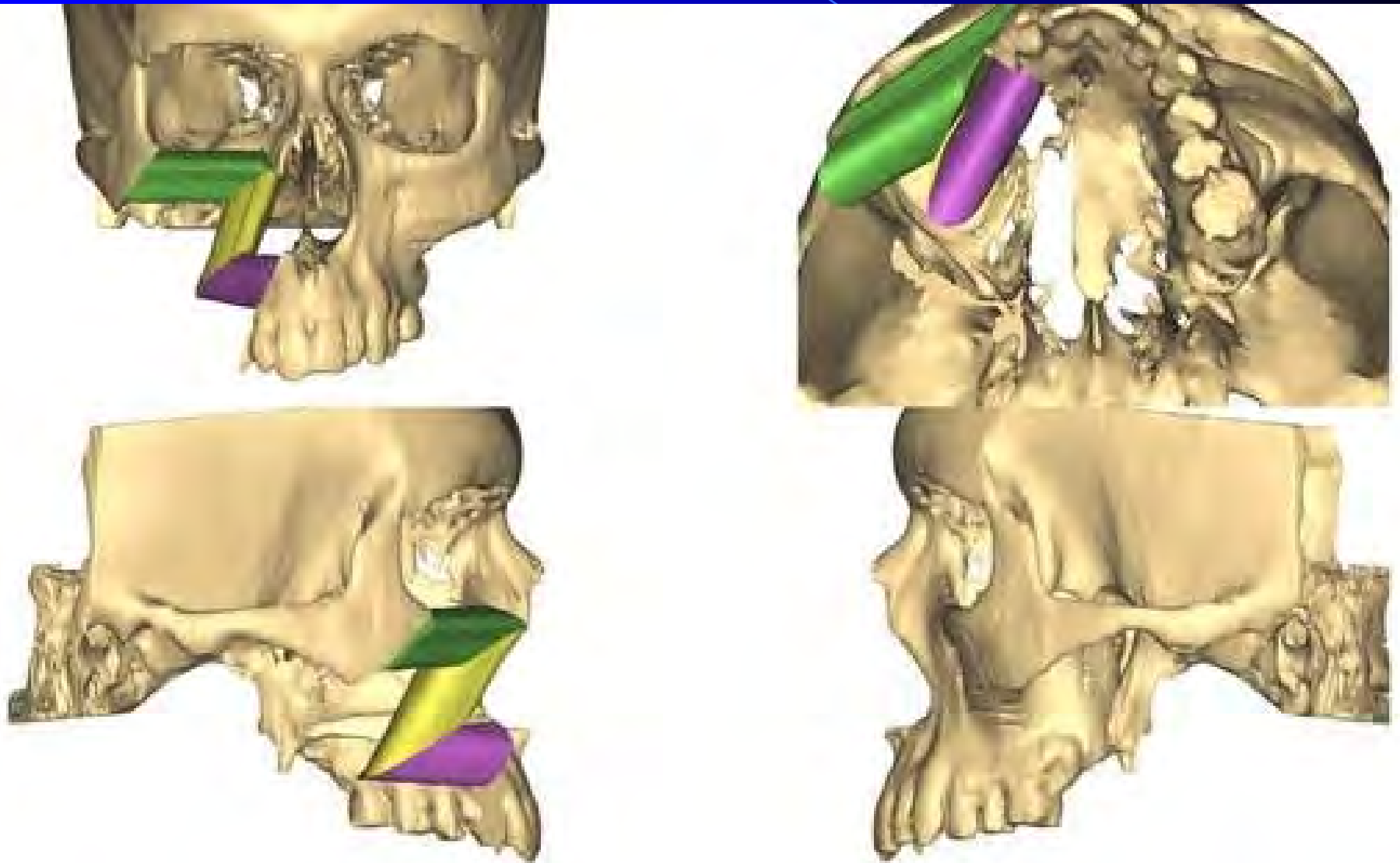
Planned Resection



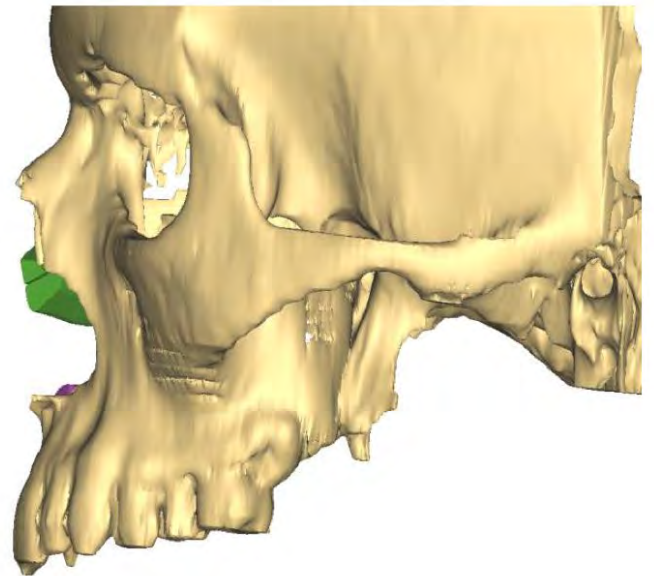
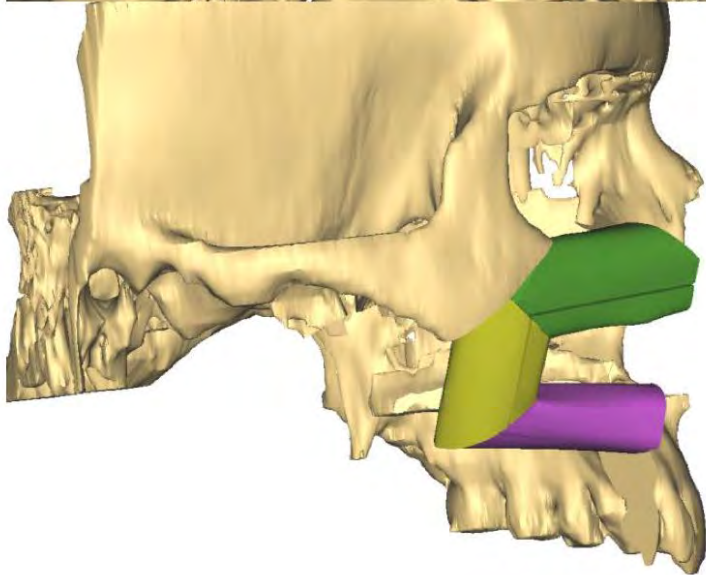
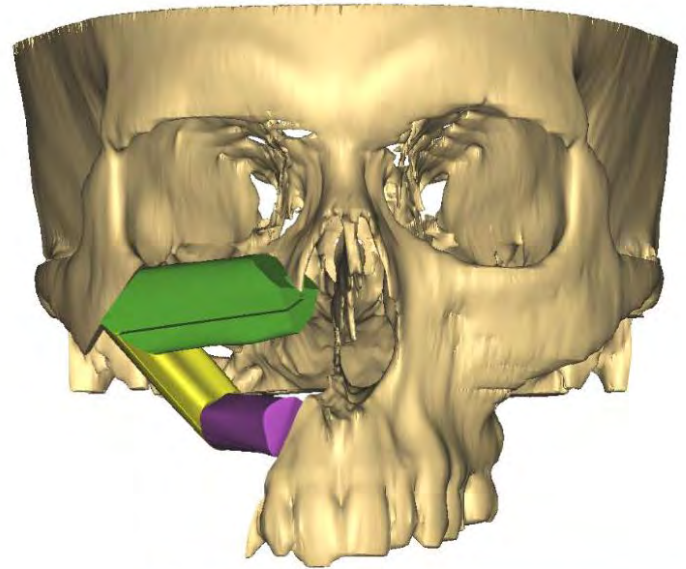
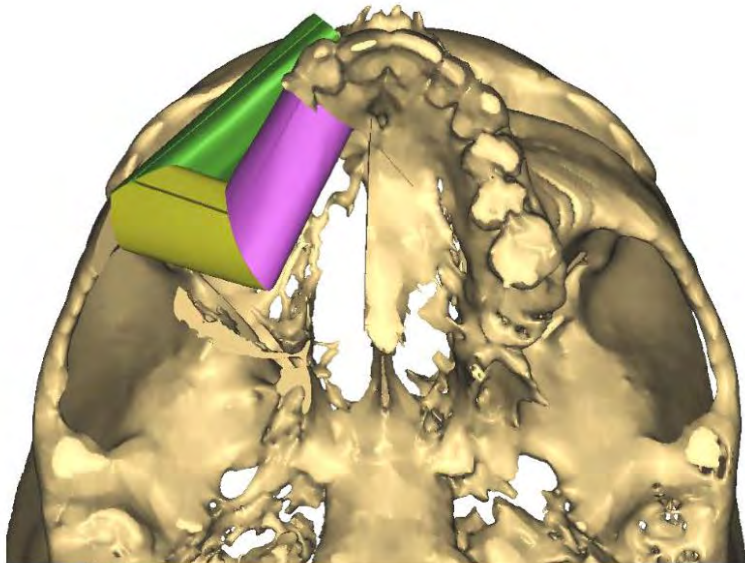
Patient Specific Maxillary Guide

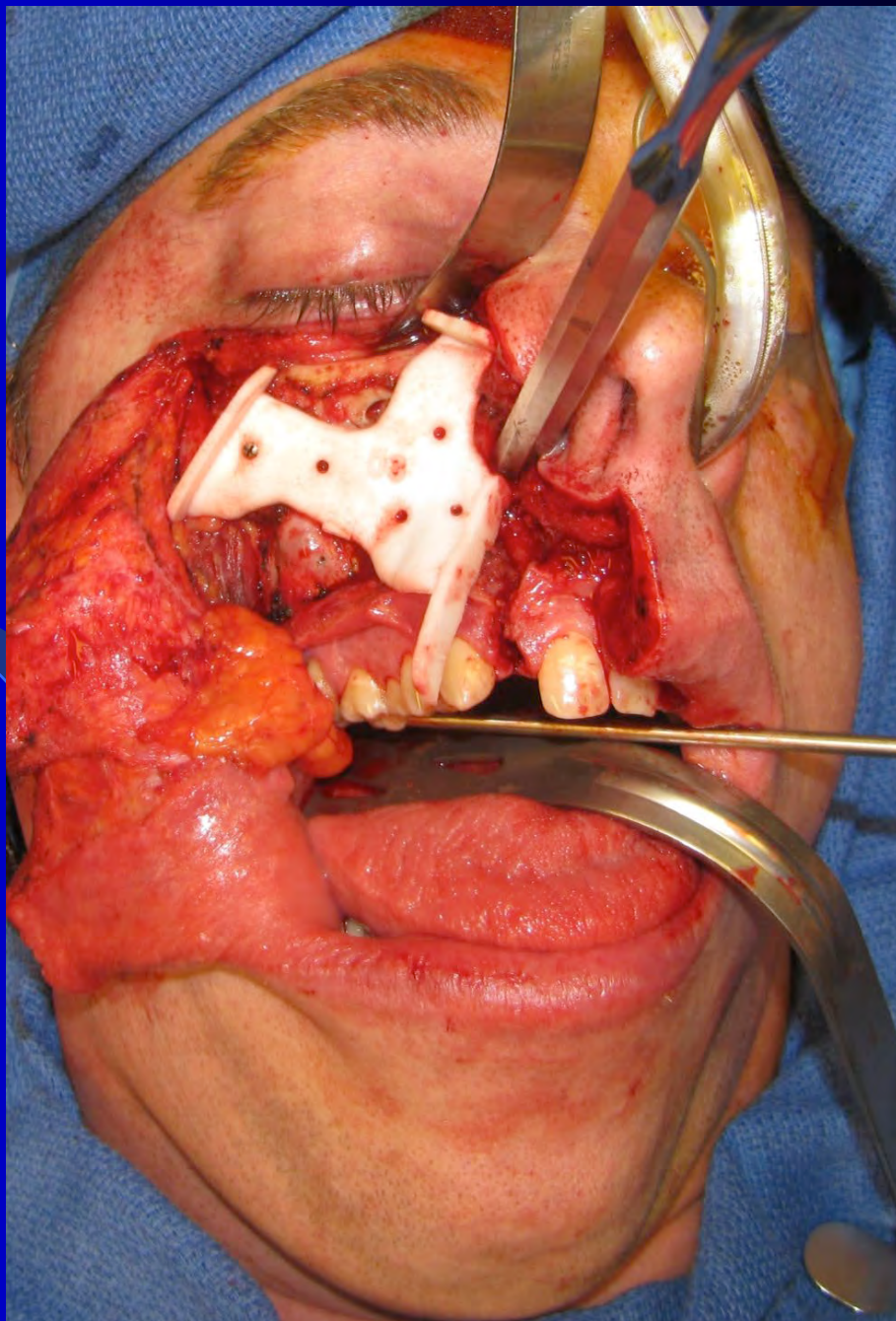
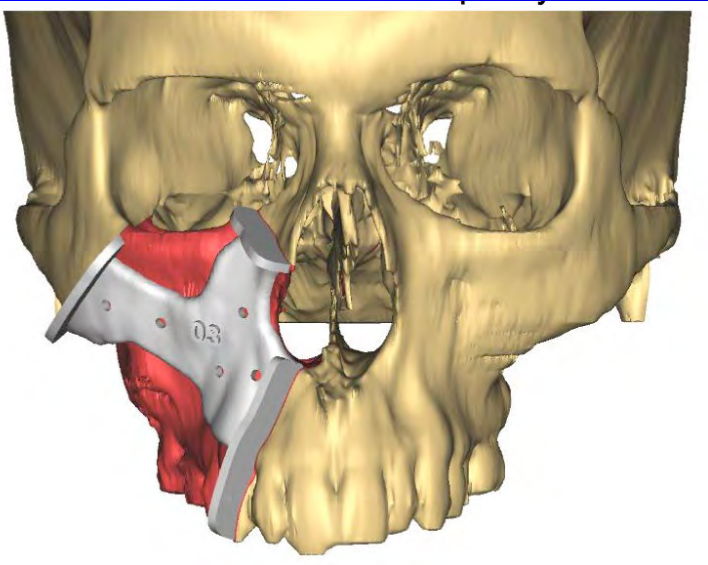


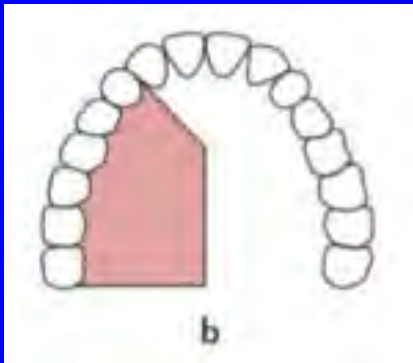
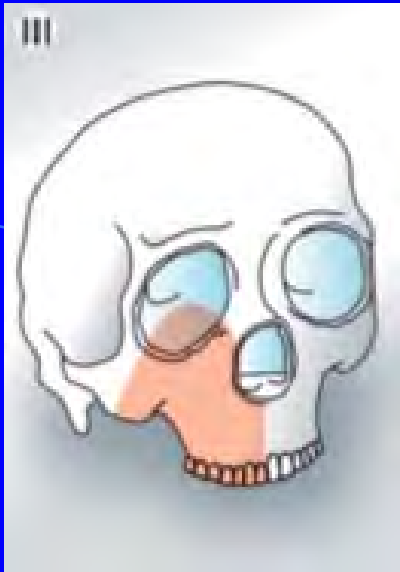
Plan A



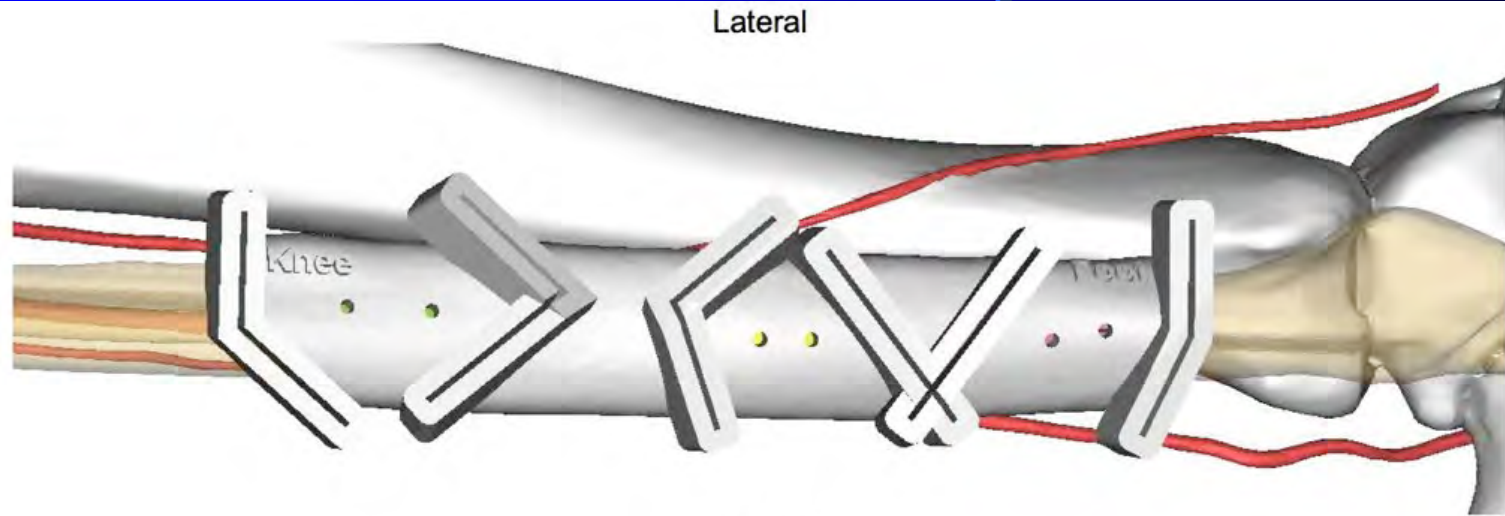
Plan B



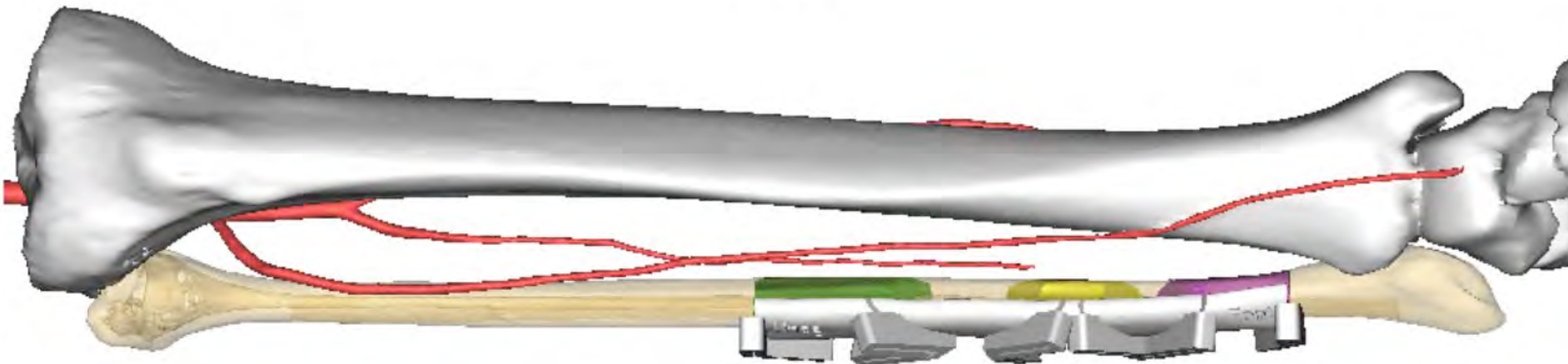


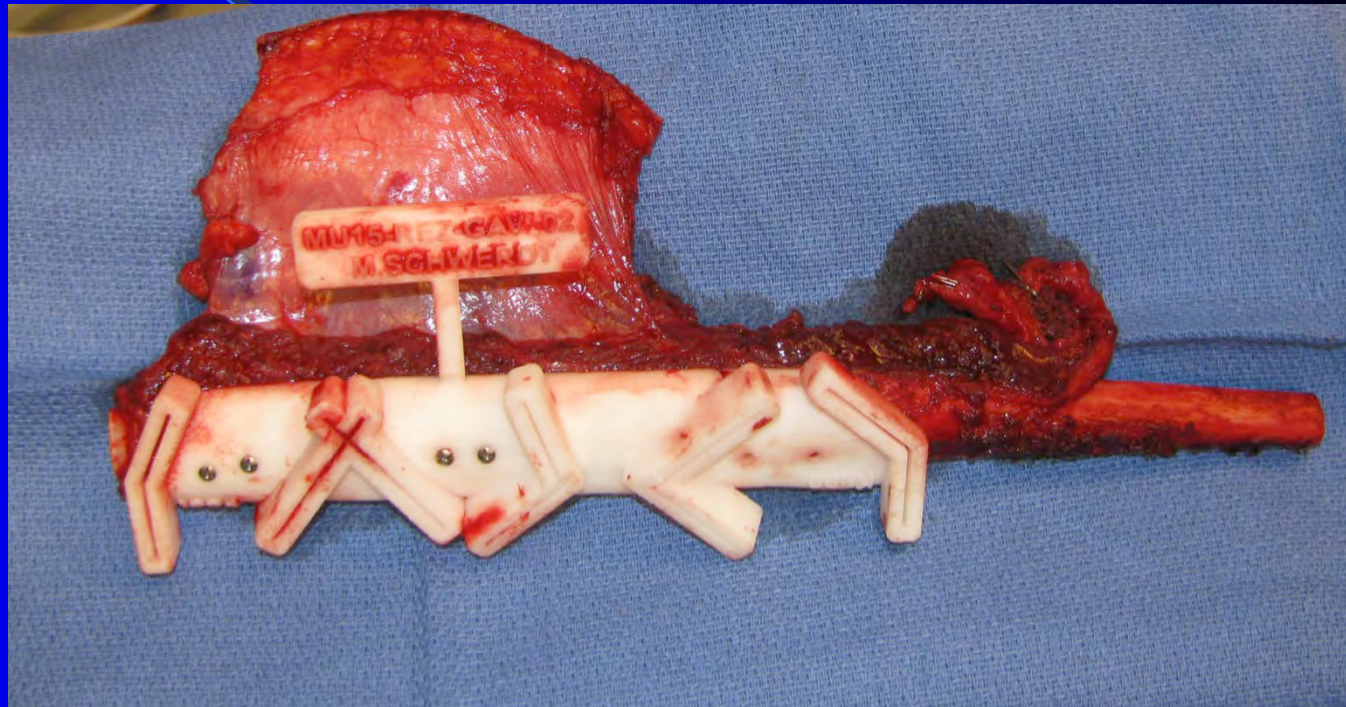
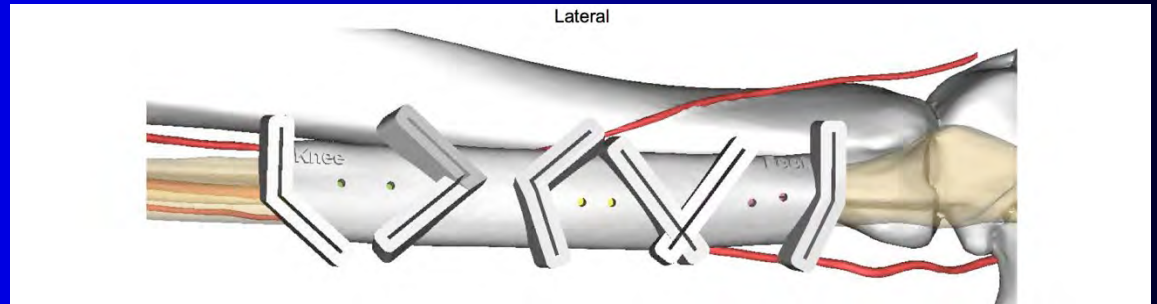


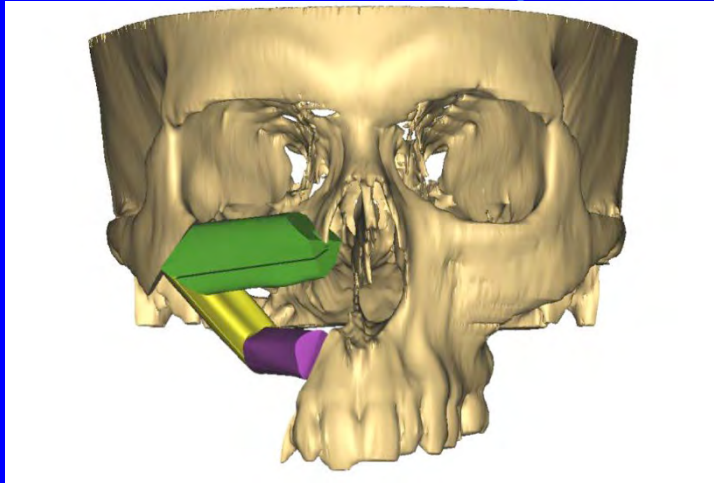
Patient Specific Fibula Cutting Guide



Anterior

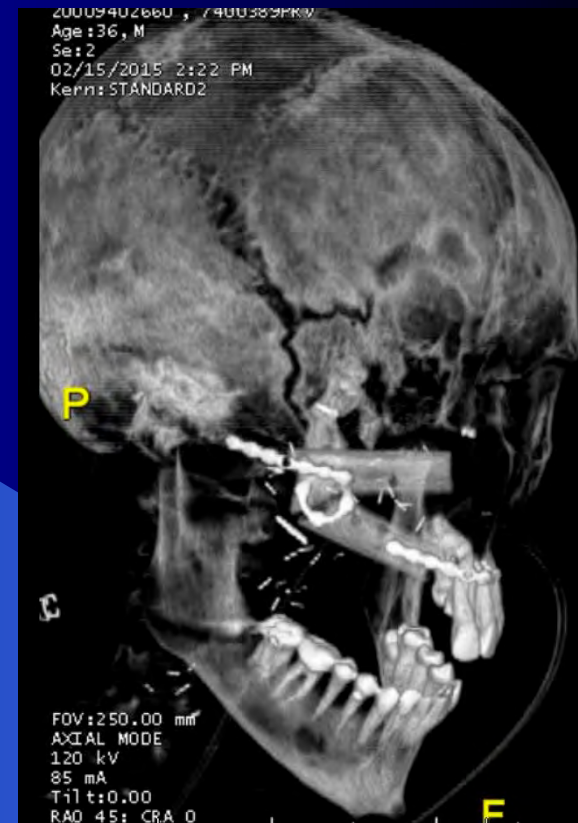
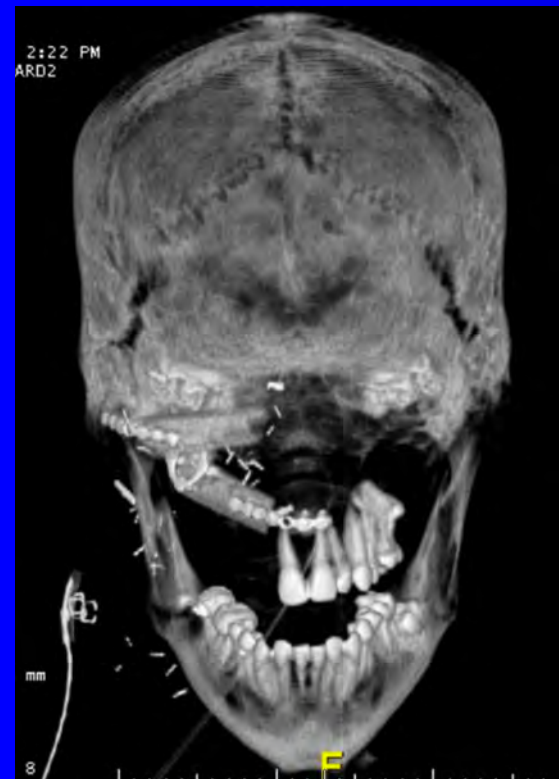








Post-Op





Fellowship





ACHIEVEMENT

YOU CAN DO ANYTHING YOU SET YOUR MIND TO WHEN YOU HAVE VISION,
DETERMINATION, AND AN ENDLESS SUPPLY OF EXPENDABLE LABOR.

What did they bring

- Case
- Ability to converse with another expert
- Great ideas
- Crappy ideas
- Implants

3D Modeling

- Initial experience
 - PSP
 - 3D Modeling
 - CTA of fibula or other bone
- >60 cases
- Time
 - Learning curve
- Now do carving in leg
 - 15-30 min in leg
 - 5 min in mouth
- When not work is a pain

City Wide Conference

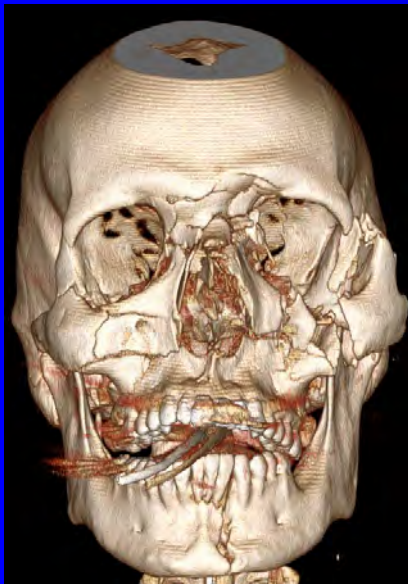
Elizabeth Shepard, MD

April 15th, 2025

Plastic Surgery Resident, PGY 5

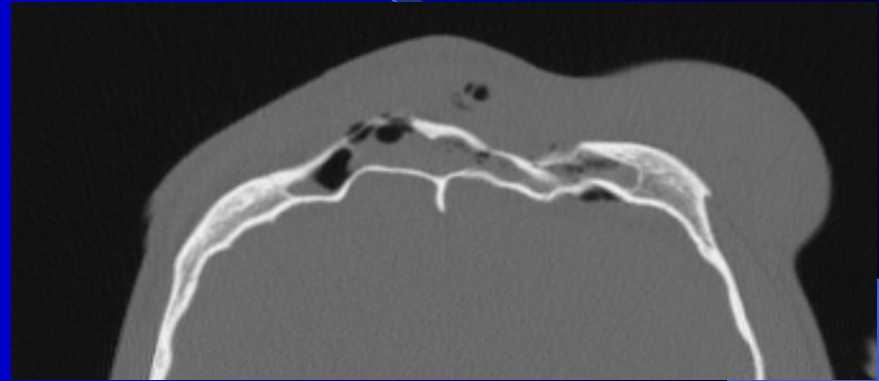
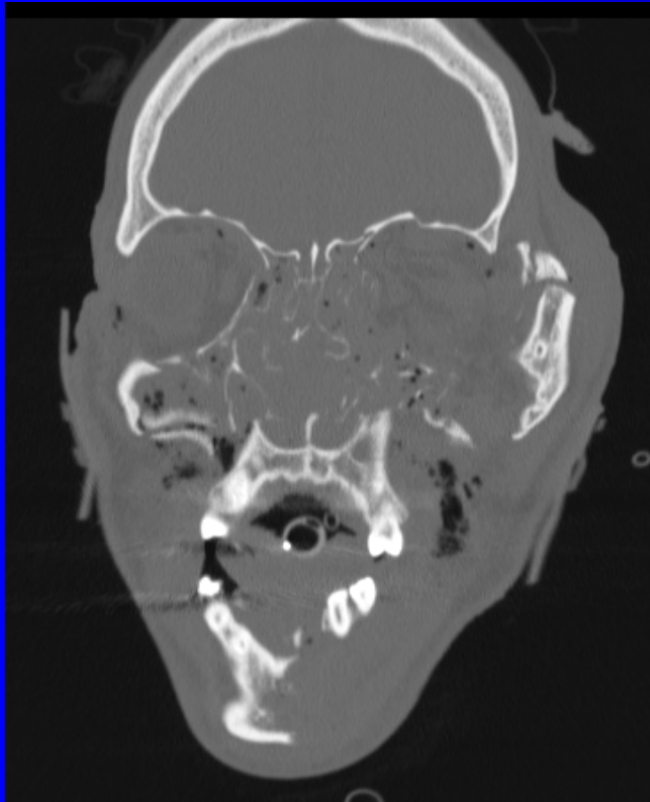
Presenting on Behalf of OHSU Otolaryngology

Panfacial Fracture: 32 yo M, Unhelmeted MCC

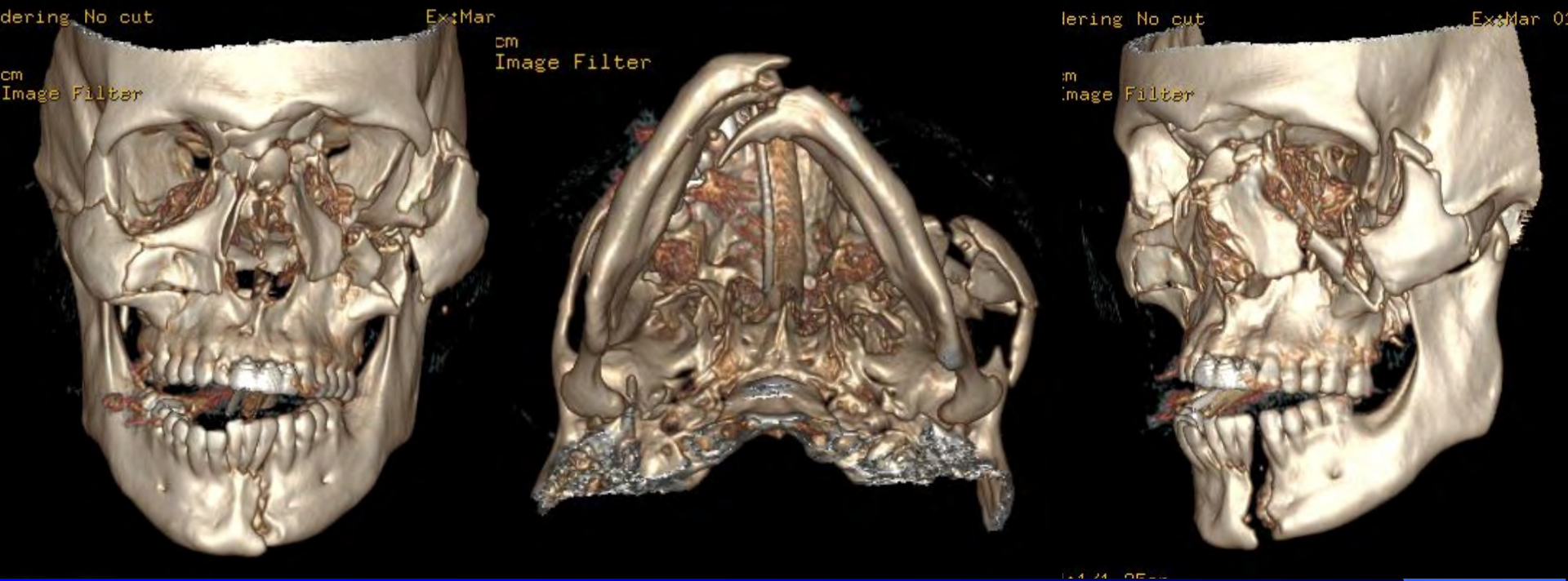


- **History:**
 - Dirt bike v motorcycle
 - Intubated on scene for airway protection
 - OSH interventions: oropharyngeal packing, L lateral canthotomy
- **Injuries:**
 - Left globe rupture
 - SAH
 - Extensive upper, middle and lower third facial fractures

Upper Third



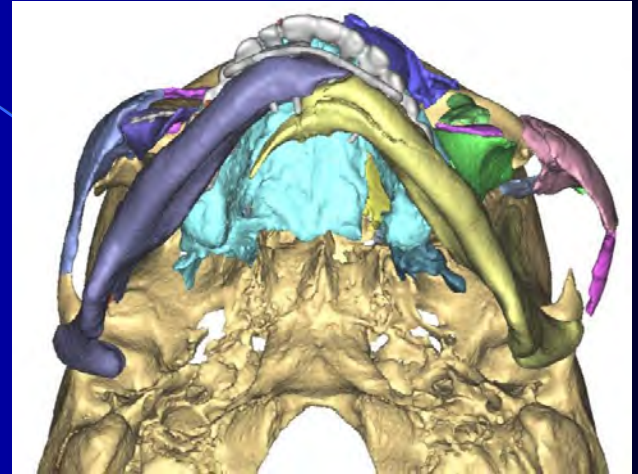
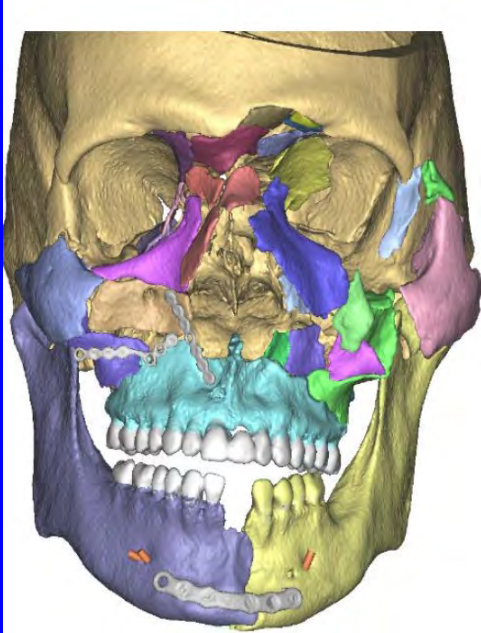
Middle and Lower Thirds



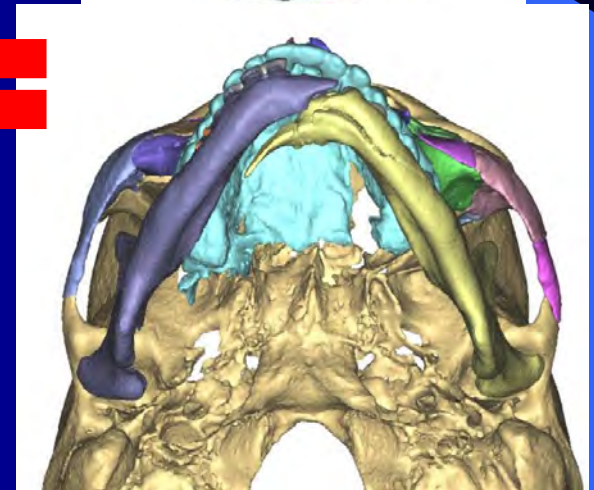
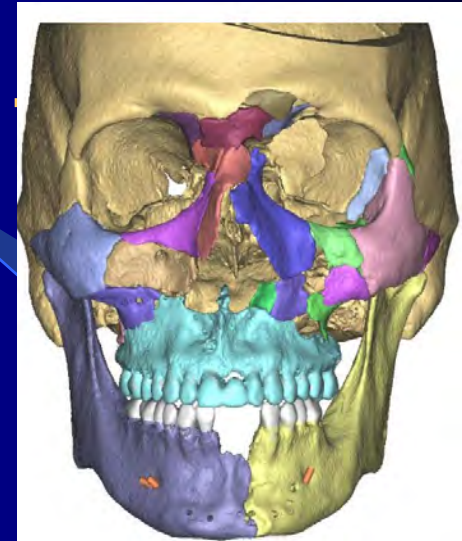
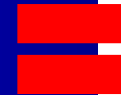
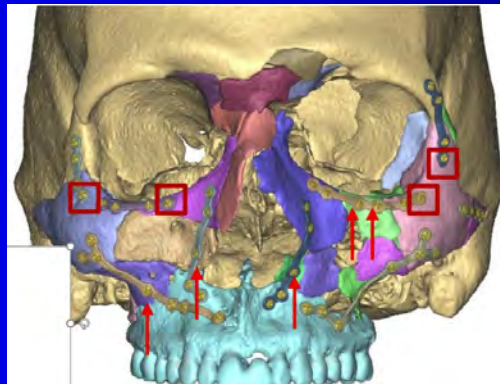
Initial Events and Surgical Plan

- **3-2-25:** OR with ophthalmology for ruptured globe repair
- Interdisciplinary discussion: Delay left midface and orbital manipulation to avoid further globe injury
- Surgical plan via staged approach:
 - Temporize with fixation of R midface and mandible now
 - Return to OR in 2 weeks once cleared by oculoplastic team
- **3-4-25:** IMF placement, ORIF mandible and ORIF right midface fractures
 - IMF screws x 6 for MMF
 - Lower gingivobuccal approach to the mandible parasymphysis fracture – recon plate fixation
 - Rowe dis impaction forceps for midface mobilization – ZM and NF buttresses plated

Post Operative from Stage One



Surgical Plan: Stage



MMF, Mandible and Midface: Intraoperative



Orbital: Intraoperative

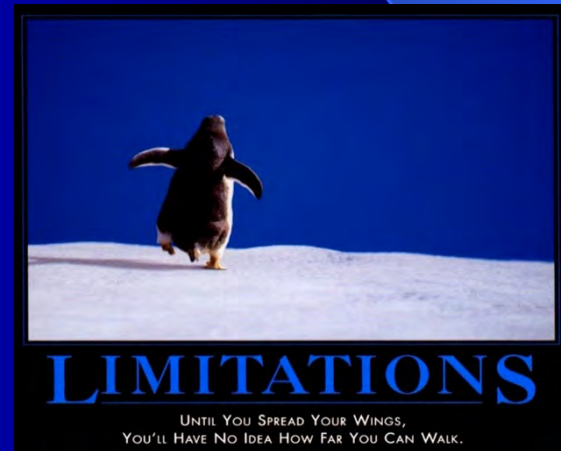


Post Operative from Stage Two



How Do I Get On The Program

- Some people have got it
 - On panels as a fellow
 - Present material as a junior
 - Know all the players
 - Career rocks
- They are not at this talk
- Bias
 - I am a volume guy



How Do I Get On The Program

- Start early, start small
- Any podium time is good time
- The more people see you the more people will know you
- Why do people go to talks
 - Topic
 - Presenter

How Do I Get On The Program

- Posters
 - Small stuff
 - People see them
 - People remember them
 - Learn to write
- Abstract
 - We get 500 poster submissions
 - Time spent on abstract
 - Read the others
 - Time spent on reading it
 - Time spent viewing
 - See what grabs your attention

How Do I Get On The Program

Scientific Sessions

- What comes your way
- What do others present that you have “better” experience
- What do you do differently
- Submit
 - Plan ahead
- What’s hot



How Do I Get On The Program

Scientific Program:

Abstract

- Takes experience
- Read journals
- Read other abstracts
- Have others read them
- Listen to others

Try not to:

- Preliminary study
more data to come
- Ongoing
- Spelling errors
- Overblow the results

How Do I Get On The Program

Expert Lectures

- Need experience
- Find a mentor
 - People know who are active
- Nothing wrong with being a junior presenter
 - Do the work
 - It needs to go well the first time



How Do I Get On The Program

Expert Lecture

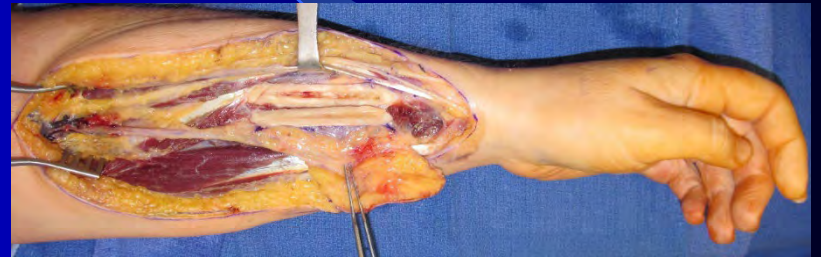
- What's interesting
 - Look at the program
 - Look at other meetings
- **Go to meetings**
 - You see the same people presenting at meetings
 - There is a reason



How Do I Get On The Program

Expert Lectures

- Practice
- Make sure the talk works
 - Videos.....
- What do others do that you can try
- Make sure the talk works



How Do I Get On The Program

Panels

- Ah the controversy, the fame, the
- Why do people come
 - Topic
 - The **People**
- If you are one of the **People** then why are you



How Do I Get On The Program

Panel

- Find a topic in your niche
- Look at what's hot
 - What others want to hear
- Be a junior
 - It's work
 - It's a lot of work



How Do I Get On The Program

Getting on the circuit

- Be present
- Attend meetings
- Volunteer, volunteer, volunteer
- Do what you say you are going to do
- Everyone that has a say in these matters has a list of their go to lackeys that get the job done
 - Get on that list



How Do I Get On The Program

- Go to meetings
 - Meet the players
 - Lucente
 - Jonas
- Volunteer
- Do the work
- We all want to help



How Do I Get On The Program

DO NOT GIVE UP



Pearls from Dr. Wax

- **Start small**
- **Show up**
- **Do the work**
- **Volunteer**
- **Get a mentor**
- **Talk to those that you want to help you**
- **Follow through**

Facial Plastics

- We are all colleagues
- Two team approach is best
- Mutually beneficial
- Actually really good for me

