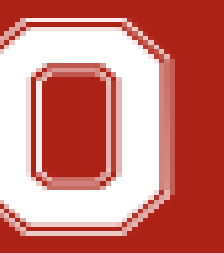


Multidisciplinary Approach To Cranioplasty - Outcomes From A 10-year Retrospective Study

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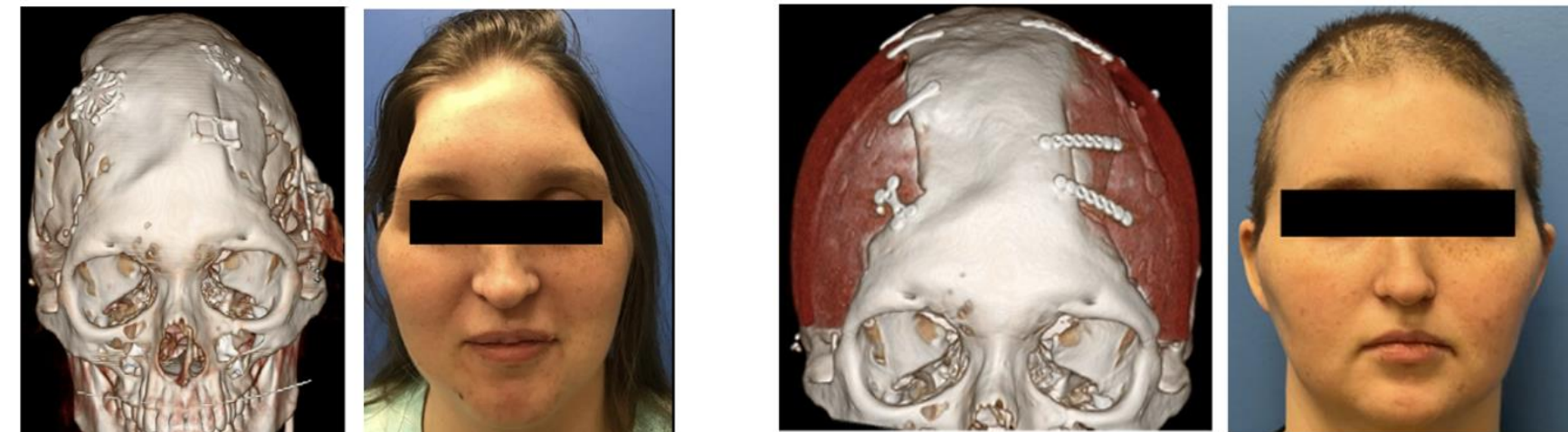
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INTRODUCTION

- Cranioplasty is a procedure used to repair the skull with autologous bone or alloplastic implant after craniectomy.



BEFORE

AFTER

- According to the literature, there is a high risk of major complications, with 15-30% of adult patients requiring reoperation and multidisciplinary approaches.
- The objective of this study was to:
 - Determine predictive factors for Plastic Surgery consult for Cranioplasty.
 - Determine whether a multidisciplinary surgical approach impacted cranioplasty outcomes.

METHODS

- Retrospective chart review of adult patients (age >18 years) undergoing cranioplasty from 2011- 2021 was performed.
- Relevant demographic data, involved surgical teams and perioperative outcomes were evaluated.
- Risk factors associated with cranioplasty failure were determined using chi-square and t-tests.
- Logistical regression was used to assess significance between the number of cranial operations and the team involved.

RESULTS

- A total of 240 patients underwent 281 cranioplasties over the 10-year period

- Cranioplasty material used were Autologous calvarial bone (n=165) , Titanium(n=60), PEEK (n=45) and PMMA (n=9)

	Neurosurgery	Neurosurgery+ PRS	Neurosurgery + ENT	
Sex				
• Male	112	12	10	
• Female	83	17	8	
Age				
• 18-29	36	6	3	
• 30-49	63	4	2	
• 50-64	71	11	7	
• 65+	25	6	6	
Patient	195 (81.25%)	29 (12.08%)	18(7.5%)	Total=240

RESULTS

INDICATION FOR CRANIOPLASTY

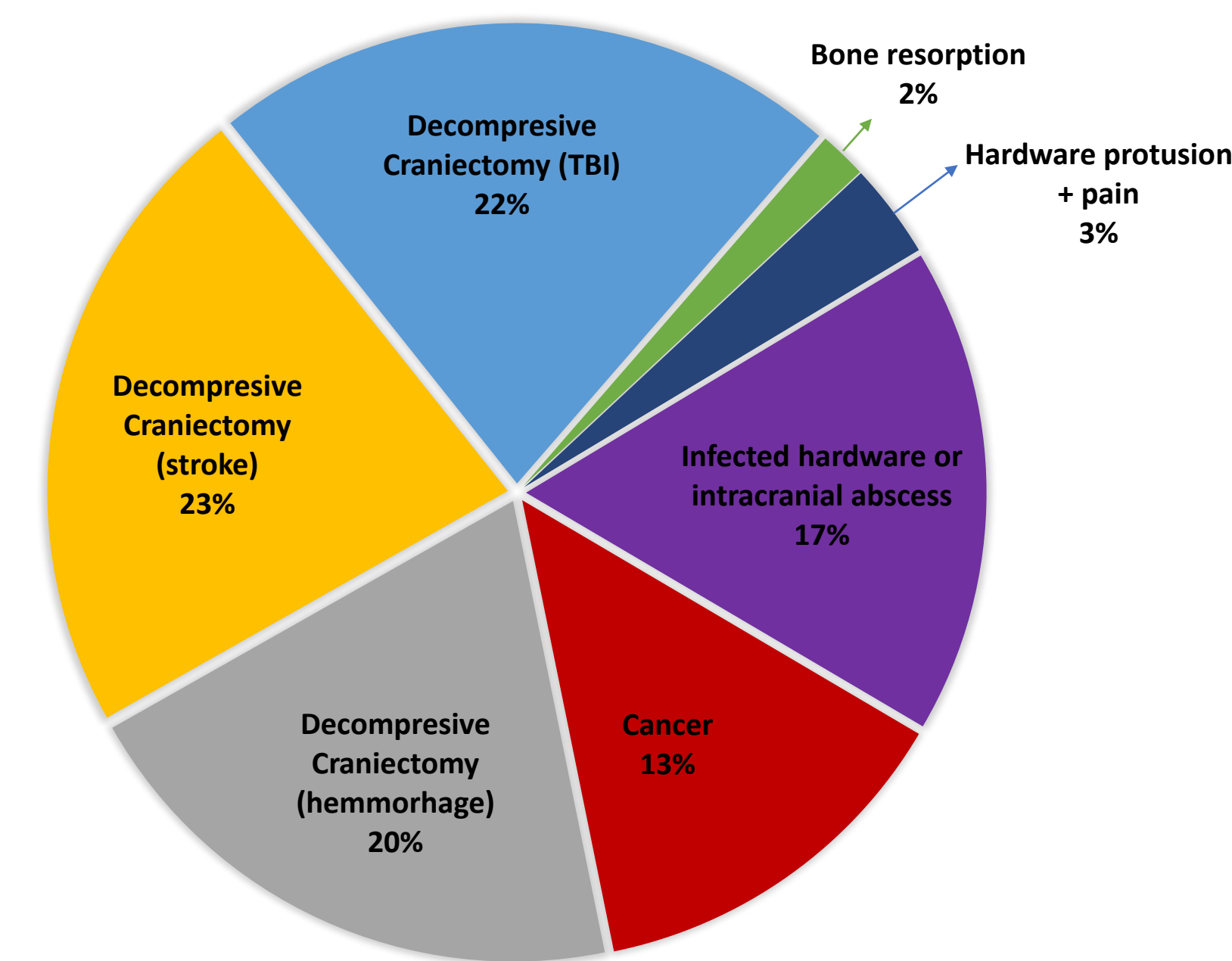


Figure 1: Indication for cranioplasty, In our cohort the major indication for cranioplasty was decompressive craniectomy due to TBI or MCA infarct

OUTCOMES AFTER CRANIOPLASTY

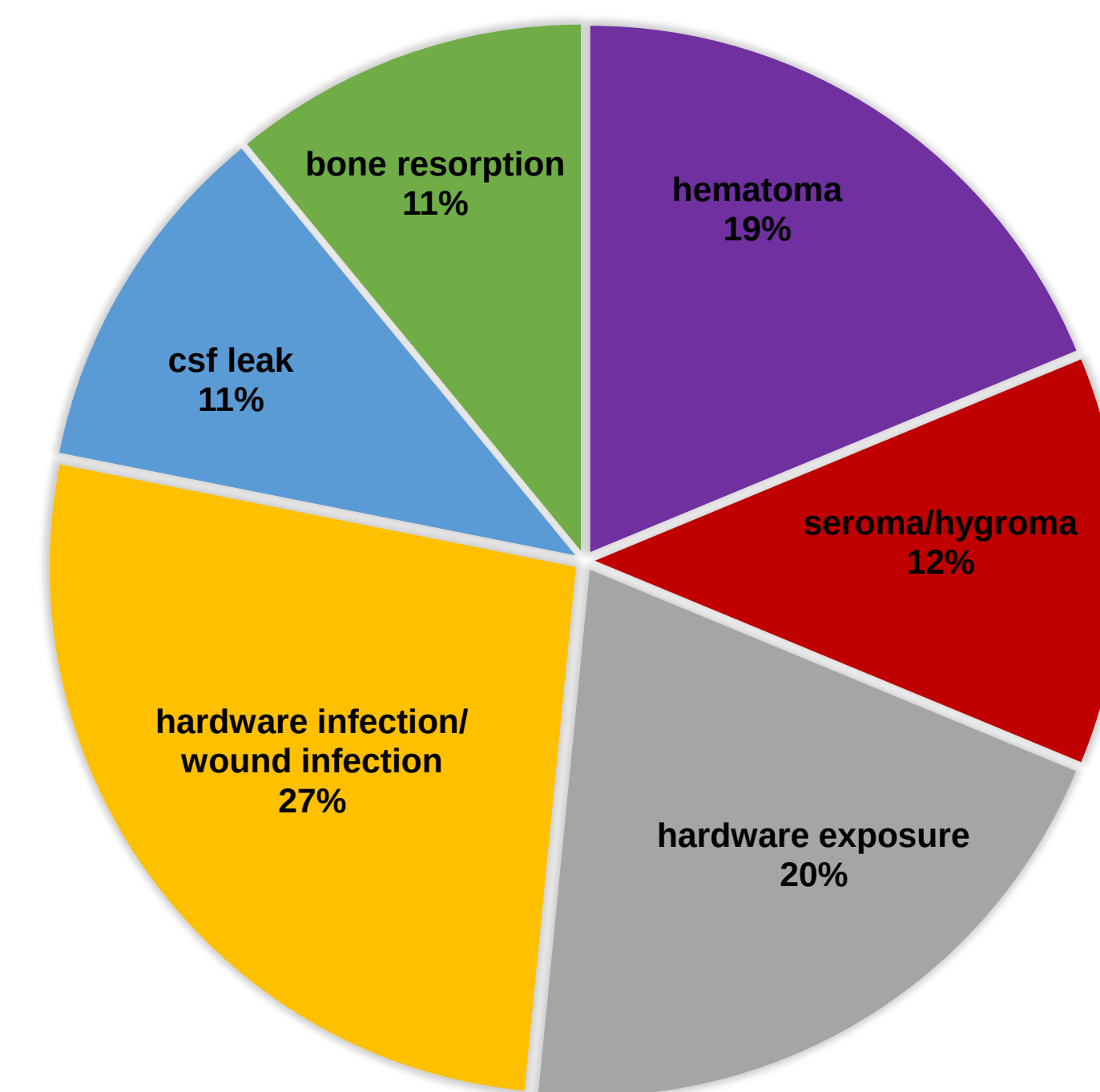


Figure 2: Outcomes of Cranioplasty, In our cohort, 23% of patients had major complications with infection being the most prevalent

RESULTS

Number of Cranial Surgeries Prior to Multidisciplinary Surgery Consult

Number of Prior Cranial Surgeries	Neurosurgery + PRS	Neurosurgery + ENT	P value
			<0.0205
0	3	7	
1	7	5	
2	5	3	
3	6	3	
4	3		
>5	3		

Figure 3: All patients had a neurosurgeon involved. Time relative to cranial operations when PRS or ENT was consulted to assist/perform case. Plastic surgeons were more likely to be involved in cases that had more previous cranial operations, including cranioplasty failures (p=0.0205).

Type of Operation Performed by PRS or ENT

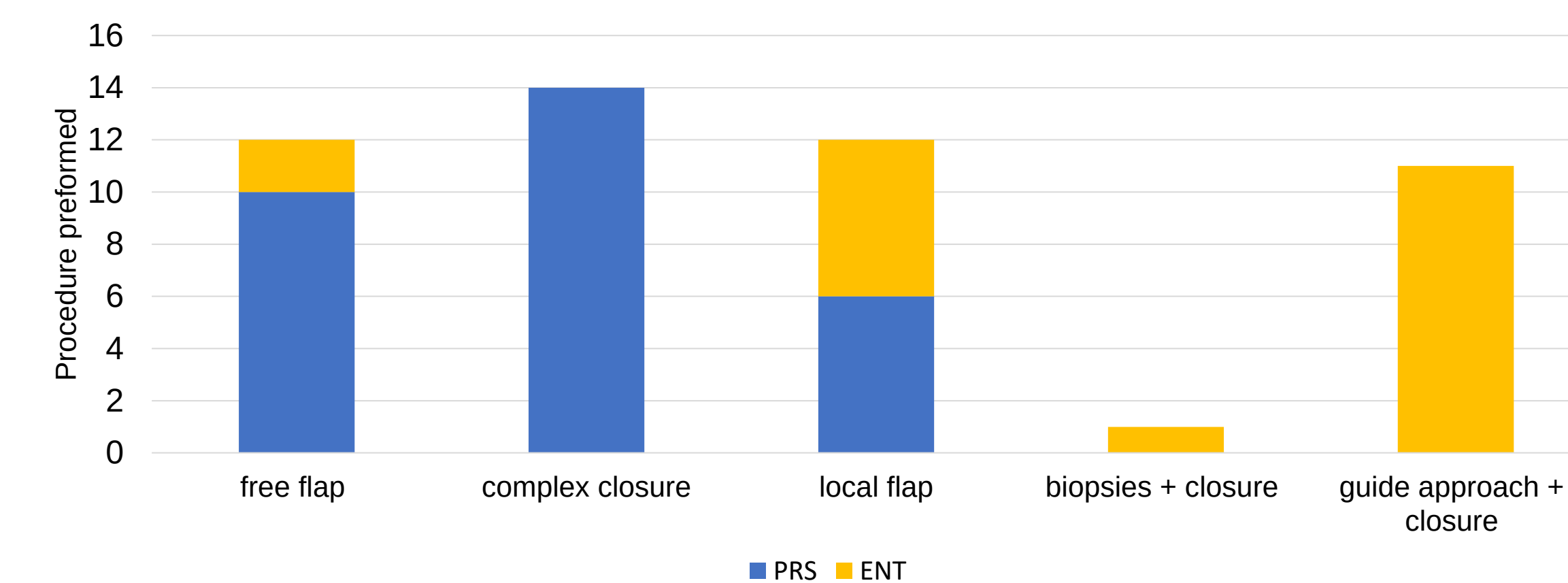


Figure 4: Details of the operation performed by the consulted team. Plastic surgery were more likely to be consulted to assist in complex closure whereas ENT were more likely to assist in guiding approach and closure of the skull base.

Percent Cranioplasty Complication

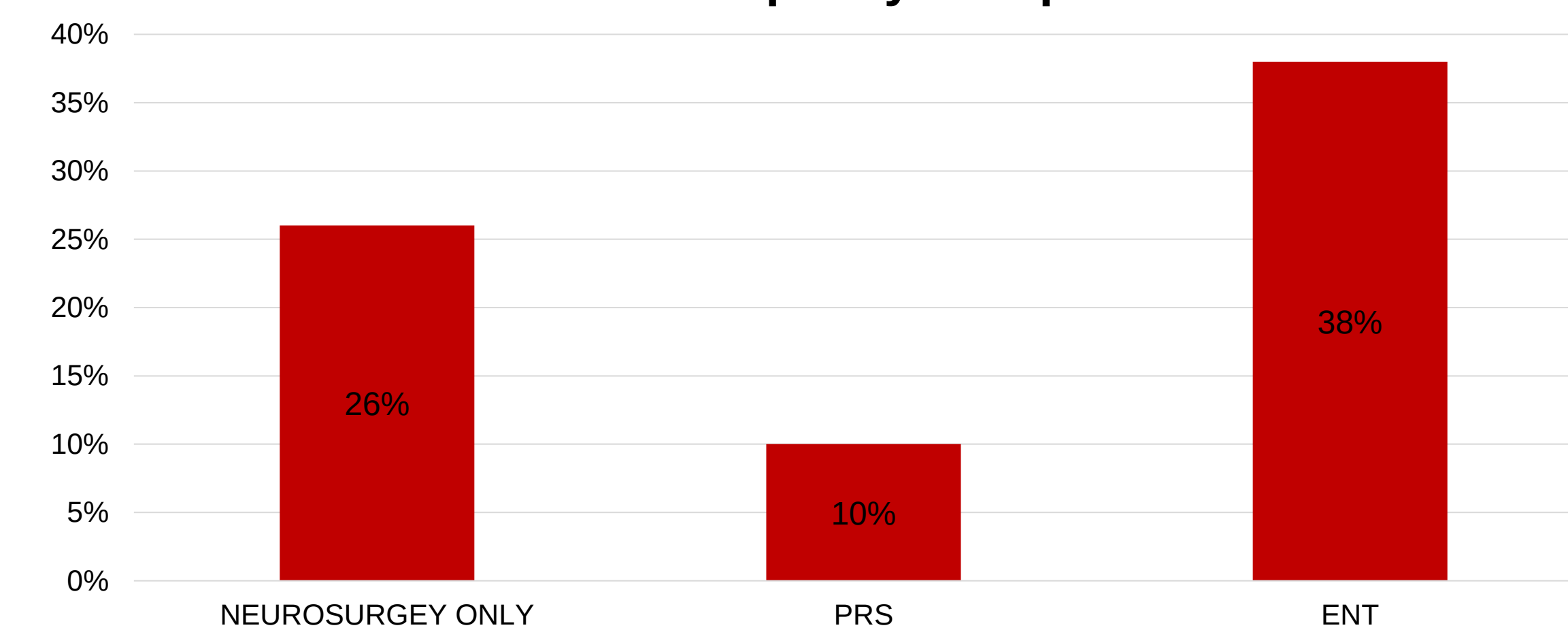


Figure 5 : Cranioplasty outcomes from the involvement after PRS or ENT. Interestingly, cases where a plastic surgeon was involved (n=29) were associated with less major complications postoperatively (n=3, p=0.0302) whereas cases where ENT were involved did not (p>0.05)

CONCLUSION

- Plastic surgeons were more likely to be involved in cases that had more previous cranial operations, including cranioplasty failures (p=0.0205).
- Cases with plastic surgery involved (n=29), were associated with fewer major complications postoperatively (n=3, p=0.0302).
- Cases with ENT involved had no significant association with subsequent complications (n=7 >p=0.05).
- Plastic surgeons are more likely to be consulted for free flaps and complex closures whereas ENT was more likely to be involved to guide surgical approaches.

FUTURE DIRECTION

- There is a need for a validated, risk stratified algorithmic approach to predict complications in cranioplasty, as well as for increased multidisciplinary care.
- At The Ohio State University, we have developed a Neuroplastic Surgery Program to provide multidisciplinary care for patients undergoing complex neurocranial procedures. Prospective studies are being done to evaluate outcomes.

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