

## INTRODUCTION

Malignant tumors of the nasal cavity and paranasal sinuses have the potential to invade into surrounding structures including the orbit.

The periorbital considered a barrier to tumor spread into the orbital cavity.

- Historically, pre-op imaging by CT or MRI for sinonasal malignancies (SNM) involving the orbit can be useful in identifying tumors with bony involvement or soft tissue, respectively
- Difficult to assess the extent of orbital invasion preoperatively
- Extent of invasion is important when determining surgical management of the orbit

Aim: To correlate the effectiveness of using preoperative imaging and intraoperative assessment to evaluate extent of orbital invasion in SNM

## METHODS

A single center, retrospective review

- 188 patients undergoing surgical resection of SNM
- 2008-2019

### Inclusion Criteria

- SNM abutting or involving the orbit on pre-treatment imaging
  - **Pre-op imaging:** mention of orbital involvement in pre-op radiology report (ie: loss of fat planes, erosion of lamina papyracea, etc.)
  - **Intra-op Assessment:** grossly invaded “orbital” tissues as recorded by the attending surgeon on operative notes
  - **Final Histopathology:** final pathology reports assessed by pathologist

### Pre-operative Orbital Involvement

The following constitutes orbital involvement in this study:

- Bony wall defect or displacement
- Invasion or displacement of soft tissue (ie: periorbita, fat, etc.)
- Gross intraorbital involvement (ie: involvement of globe)

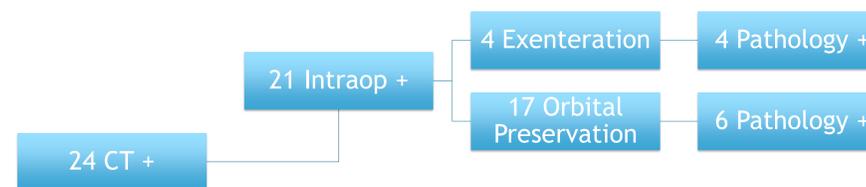
## RESULTS

Total 188 cases of SNM reviewed

82 met inclusion criteria of preoperative orbital involvement

- Average age: 63 years
- Male: 57%
- Most common histopathologic subtype: squamous cell carcinoma (SCC) (30%)
- Most common primary tumor site: maxillary sinus (38%)
- 22 underwent orbital exenteration

### Orbital Bony Wall Involvement



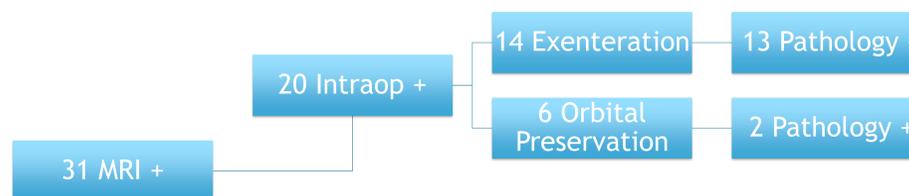
**Pre-op CT imaging** as a predictor of positive final pathology on orbital bone wall specimens

<b>SENSITIVITY</b>	<b>100%</b>
<b>SPECIFICITY</b>	<b>69.84%</b>
<b>PPV*</b>	<b>34.48%</b>
<b>NPV*</b>	<b>100%</b>

**Operative Assessment** as a predictor of positive final pathology on orbital bone wall specimens

<b>SENSITIVITY</b>	<b>60%</b>
<b>SPECIFICITY</b>	<b>68.66%</b>
<b>PPV</b>	<b>22.22%</b>
<b>NPV</b>	<b>92%</b>

### Orbital Soft Tissue Involvement



**Pre-op MRI imaging** as a predictor of positive final pathology on orbital soft tissue specimens

<b>SENSITIVITY</b>	<b>83.33%</b>
<b>SPECIFICITY</b>	<b>72.88%</b>
<b>PPV</b>	<b>48.39%</b>
<b>NPV</b>	<b>93.48%</b>

**Operative MRI imaging** as a predictor of positive final pathology on orbital soft tissue specimens

<b>SENSITIVITY</b>	<b>45.83%</b>
<b>SPECIFICITY</b>	<b>59.62%</b>
<b>PPV</b>	<b>34.37%</b>
<b>NPV</b>	<b>73.45%</b>

\*- PPV: positive predictive value; NPV: negative predictive value

## DISCUSSION

### Orbital Bony Wall

- Pre-operative CT has high sensitivity and NPV for bony tumor involvement
- Intra-operative assessment limited in ruling out disease, but still has a high NPV

### Soft Tissue

- MRI NPV > PPV, thus intra-operative frozen sections is valuable in confirming any suspected invasion
- Overall, intra-operative assessment comparatively poor at both ruling in and ruling out periorbital tumor involvement

Management of SNM with concerning findings for orbital involvement are a challenging group to manage

- Many factors go into determining preservation of orbit vs need for exenteration to achieve adequate disease control

Tumor abutting the orbit can often look like invasion on imaging and intraoperative assessment

Preoperative imaging should not be the gold standard for determining need for exenteration vs. orbital preservation

- As shown by this data, combined intraoperative assessment and biopsy is critical in evaluation of extent of tumor invasion

This study re-enforces the need for intraoperative pathological consultation when attempting to preserve critical structures

## REFERENCES

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