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# Acquired Occipital Neuralgia Following Transtemporal Skull Base Surgery

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## ABSTRACT

**Introduction:** Transtemporal skull base access is utilized in the surgical extirpation of jugular foramen, petrous apex, posterior fossa, and clival tumors. Regardless of the length or location of the inferior limb of the retroauricular incision, the dissection, splitting, or inferior retraction of the adjacent musculature may cause traction, thermal injury, or scar encasement of the occipital nerve. Inadvertent injury to this sensory nerve may result in delayed and persistent pain, tenderness or occipital headaches. Relief of such symptoms with long-acting local anesthetic injections may suggest occipital nerve irritation which can be relieved with soft tissue neural decompression.

**Materials and Methods.** This was a retrospective review of 10 patients from 2000-2012. 7 of these patients ultimately underwent definitive treatment with occipital nerve decompression while the remaining 3 have been treated with local anesthetic injections only.

**Results:** Of the 7 patients who ultimately underwent surgical decompression, 5 had previously had injections for pain control with an average of 2.5 injections. Injection relief lasted a maximum of one month with the majority of the patients requiring multiple injections. 4 out of 5 pts receiving surgical decompression had complete pain relief on last follow up.

**Conclusions:** Transtemporal skull base surgery carries a risk of chronic occipital headaches due to potential for nerve injury or adjacent scarring. There are many options for the treatment of these pains but the majority are temporary. A surgical option of occipital nerve decompression should be presented to these patients who are looking for a more permanent option or are not interested or not obtaining relief with the medical management of these issues.

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## INTRODUCTION

Transtemporal skull base access is utilized in the surgical extirpation of jugular foramen, petrous apex, posterior fossa, and clival tumors. A substantial portion of patients experience post-operative occipital headaches that are believed to be due to scar encasement, thermal injury or adjacent muscular traction of the occipital nerve. Despite attempts to avoid injury by assuring proper retroauricular incision placement, limiting incision length and minimizing soft tissue retraction, patients still develop these headaches. Numerous techniques, including various oral pain medications, anesthetic patches and injections, have been used to relieve these symptoms with varying results. Local anesthetic and steroid injections have proven effective in some cases, giving credence to the proposed nerve irritation etiology of these headaches. It also indicates that soft tissue neural decompression may be an alternative therapy with longer lasting relief. This will outline our intraoperative findings and long-term results in patients who underwent delayed wound exploration of the occipital nerve following various transtemporal approaches for skull base tumors.

## METHODS AND MATERIALS

A retrospective review of 10 patients was performed. 3 of these patients underwent initial occipital nerve decompression, 4 have been treated with injections followed by decompression while the remaining 3 have been treated with local anesthetic injections only. IRB approval was obtained. The electronic health records and operative reports were obtained from Sept 2000 until present.



Figure 1. Incision for surgical decompression.

## RESULTS

A total of 10 patients were reviewed. Of the 7 patients who ultimately underwent surgical decompression, 4 had previously had injections for pain control with an average of 2.5 injections. These 4 patients had also tried an assortment of medical options with one patient trying a total of 13 forms of pain relief. Following surgery, 5 of the 7 patients had total or near total pain relief, 1 with slight improvement and 1 with only 4 days of pain resolution. Of the 3 patients undergoing anesthetic injections only, one patient had multiple injections while the remaining 2 only had one injection. This relief lasted a maximum of one month and the patient requiring multiple injections also went on to undergo radiofrequency ablation of the nerve.

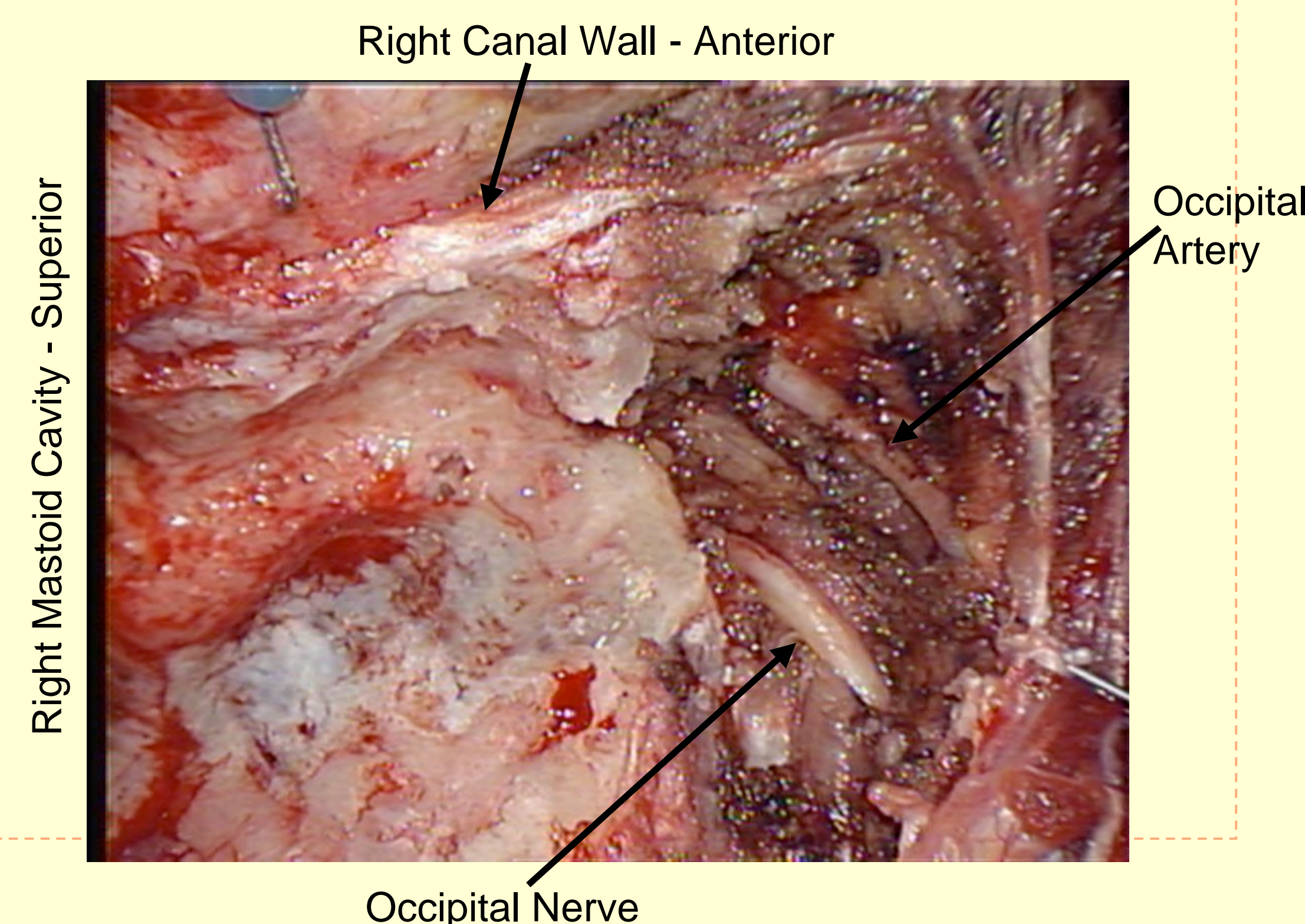


Figure 2. Surgical wound during decompression

Patient #	Approach	# of medications tried	# of injections	Time of relief w/injection	Time/% relief w/neurolysis
1	TL	9	3	1 week	
2	RS	4	1	1 day	
3	RS	6	1	1 month	
4	RS	6	2	10 days with	Almost total
5	RS	1	2	2 weeks	Complete
6	RS	13	2	1 day to 2 weeks	4 days
7	RS	2	4	3 months	3.5 months/significant relief
8	TL	0	0		Complete
9	RS	0	0		Complete
10	RS	0	0		8 months/slight improvement

RS Retrosigmoid  
TL Translabyrinthine

Injection only  
Injection and surgery  
Surgery only

Table 1. Occipital neuralgia relief.

## DISCUSSION

Occipital neuralgia is a term used to describe a constellation of symptoms typically characterized by chronic posteriorly based headaches with sharp pains radiating to the scalp. It is frequently idiopathic in nature, caused by greater or lesser occipital nerve compression from the nuchal musculature but can be iatrogenic in nature. It is diagnosed as it is commonly treated; with an occipital nerve block. Chronic post-operative headaches have been a well described complication of transtemporal skull base approaches, particularly with the retrosigmoid approach. This has previously been associated to potential dural adherence to the overlying muscles. Scar encasement or nerve injury of the occipital nerves has been proposed as a potential mechanism of post-operative occipital neuralgia. This series of 10 patients with chronic occipital neuralgia examines the potential treatment option of surgical nerve decompression or neurolysis. Of those undergoing surgical treatment, 5 out of 7 experienced substantial and long-term improvement in their headaches. This is in contrast to our injection group which had a maximum of one month of pain alleviation.

## CONCLUSIONS

Transtemporal skull base surgery carries a risk of chronic occipital headaches due to potential for nerve injury or adjacent scarring. There are many options for the treatment of these pains but the majority are temporary. A surgical option of occipital nerve decompression should be presented to these patients who are looking for a more permanent option or are not interested in the medical management of these issues.

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