

## Introduction

While postoperative outcomes of acoustic neuroma (AN) resection most commonly consider hearing preservation and facial function, headache and incisional pain are important quality of life factors. While postoperative headache is described in the literature, there is limited discussion specific to postoperative occipital neuralgia (ON) following AN resection, which has both medical and surgical treatment options available. We report our experience with this challenging complication to better elucidate effective management.

## Methods

We conducted a retrospective review of 872 AN patients, without neurofibromatosis type 2, who underwent surgical resection at our institution between 1988 and 2017. Fifteen patients (1.9%) met ICHD criteria for ON postoperatively. All patients had undergone resection via a retrosigmoid (RS), translabyrinthine (TL), or combined (RS/TL) approach via a retroauricular incision with layered flap elevation. Duration and severity of ON and response to treatment modalities, such as pain medications, occipital nerve blocks and surgical nerve decompression or occipital neurectomy, were recorded. Potential predictors for the development of ON were assessed with binary logistic regression models.

## Results

Of the fifteen patients, there were 13 (86.7%) RS, 1 (6.7%) TL, and 1 (6.7%) RS/TL. RS had a 6.85 times more likely to develop ON (OR 6.85, 95% CI: 1.55–30.39,  $p=.01$ ). Sex, BMI, tumor size and preoperative headaches did not correlate to a risk of ON.

Six (40%) were successfully treated with conservative management alone. They averaged 4 medications (2-6) trialed, with control at a mean of 64 months (13-104).

Nine patients (60%) were managed with surgery (8) or a C2-3 radiofrequency ablation (1). Two surgical patients had surgery prior to ON block or a trial of second line medication. Three patients had a external neurolysis and 5 had a neurectomy, 4 of whom had a notable neuroma that was resected. One patient who ultimately had a neurectomy had a prior external neurolysis without improvement.

Of the 8 patients who underwent surgical ON treatment, 4 (50%) had pain resolution, 2 (25%) continued to have pain postoperatively, and 2 (25%) were lost to follow-up. For the 4 patients who obtained pain control following surgery, it took an average of 4.8 months (1-9) postoperatively and 18.2 months (10-30) after first presentation to achieve it. The patient who received a C2-3 ablation had pain relief postprocedurally.

AN resection approach	Months from AN resection to ON onset	Nerve block prior to surgery	Months from ON onset to ON surgery	Procedure	Neuroma	Months from ON surgery to pain control
RS	1	Yes	8	Neurectomy	No	9
RS	2	Yes	5	External neurolysis	No	0
RS	1	Yes	15	Neurectomy	Yes	1
RS/TL	4	No	12	External neurolysis	No	Lost to f/u
RS	12	Yes	3	Neurectomy	Yes	7
RS	5	Yes	18	Neurectomy*	Yes	0
RS	0	No	28	Neurectomy	Yes	2
RS	0	Yes	16	External neurolysis	No	Lost to f/u

\* Patient had an external neurolysis 7 months prior

## Conclusions

While some of the literature suggest that patients with ON following surgery will not respond to drug treatment, our population suggests a nuanced response to the different treatment modalities. Thus, we suggest a thorough course of medical management and occipital nerve blocks prior to pursuing surgical treatment. Further studies are needed to identify the salient characteristics that define which patients will respond to pain medications and which will need more invasive treatment.

## Learning Objectives

- ON is an uncommon, but disabling and challenging postoperative complication following acoustic neuroma resection.
- The retrosigmoid approach, as compared to translabyrinthine, has a higher risk of postoperative ON, although this makes up less than 4% of patients with a retrosigmoid approach overall.
- Many postoperative ON patients necessitate surgery to improve their pain, but some respond well to drug treatment and occipital nerve blocks and do not necessitate surgery.

## References

Ducic I, Felder JM, Endara M. Postoperative headache following acoustic neuroma resection: Occipital nerve injuries are associated with a treatable occipital neuralgia. *Headache*. 2012;52(7):1136-1145. doi: 10.1111/j.1526-4610.2011.02068.x [doi].