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IDEAS AND INNOVATIONS

Reconstructive

Optimizing Exposure for the Occipital Nerve in Migraine Surgery while Maintaining Hair Length

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Summary: Surgical decompression of the greater occipital nerve is used in the treatment of migraine headaches. Generally, hair is removed from the posterior scalp to aid with exposure and minimize interference. The securing of occipital hair with surgical tape and rubber bands instead of preoperative hair removal is a viable alternative. The preservation of hair length can lead to better patient satisfaction by avoiding the hair length discrepancies and has demonstrated a low risk of surgical-site infection. *(Plast Reconstr Surg Glob Open 2017;5:e1518; doi: 10.1097/GOX.0000000000001518; Published online 9 November 2017.)*

BACKGROUND

Migraine headache, a neurologic disorder characterized by recurrent and debilitating headache, affects approximately 35 million Americans and costs close to $14 billion annually in productivity.[1] The peripheral theory of migraines was first proposed by Guyuron et al.[2] after noticing that some patients experienced alleviation of migraine symptoms after undergoing endoscopic brow lift with surgical dissection of the supraorbital and supratrochlear nerves (STNs). Although there are several theories regarding the pathophysiology of migraine headaches, there is increasing support of a mechanism due to peripheral activation of the trigeminovascular system.[3] A significant proportion of migraine headaches are caused by neural irritation, including the occipital nerve among others. The greater occipital nerve (GON) has multiple potential compression points including (1) between the semispinalis and the obliquus capitis inferior muscles; (2) at the intersection with the occipital artery; and (3) at the entry or exit from the semispinalis capitis or trapezius muscles.[4] Although not first-line therapy, surgery for migraine headache is effective for those who are inadequately treated with conventional regimens including pharmacologic and behavioral interventions.

Occipital trigger sites for migraine headaches exist in a significant proportion of patients with migraine, almost all of whom experience an improvement in symptoms after surgical decompression of the GON.[5] To gain access to the GON, third occipital nerve (TON), and/or lesser occipital nerve (LON), a midline incision is made at the occiput. The patient's hair is shaven or trimmed preoperatively approximately 2 cm in width.[6] Although this may reduce obstruction, it leaves patients with an unappealing variation in hair length at the occiput resembling a reverse mohawk, which may take several weeks or months for hair growth to resume normal length. Guidelines state it is best to avoid preoperative hair removal when possible to reduce the rates of surgical-site infection (SSI).[7] We suggest an alternative approach whereby the hair is parted and secured away from the surgical site using sterile surgical tape and rubber bands (Figs. 1–4) resulting in a more natural outcome (Fig. 5). The purpose of this study was to demonstrate adequate exposure to the GONs and less obvious postoperative appearance by avoiding the stigmata of the shaven posterior scalp previously described with occipital nerve decompression.

METHODS

We performed a retrospective analysis of all occipital nerve decompression surgeries by a single surgeon between the years of 2013 and 2016 at an academic medical center. Patient age, date of surgery, complications, concurrent procedures, follow-ups, and symptoms were retrieved.

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Fig. 1. Intraoperative view at the beginning of surgery.

Fig. 2. Incision with placement of surgical tape and rubber bands.

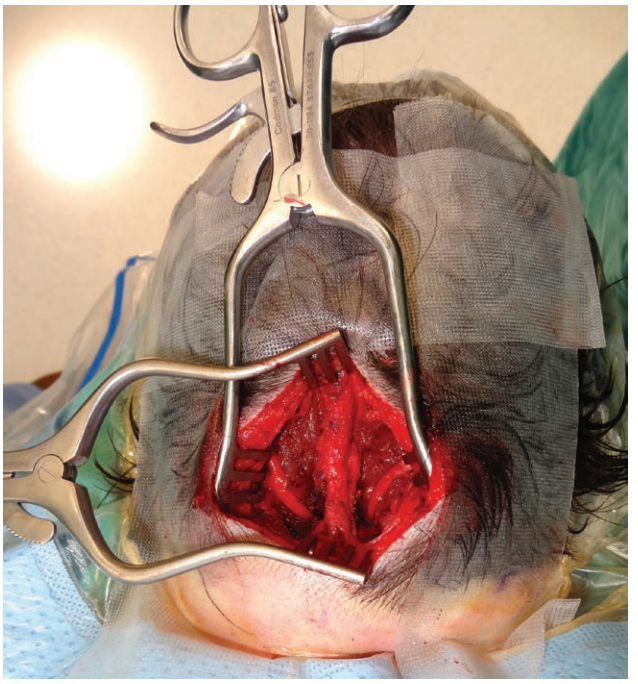

Fig. 3. Intraoperative exposure.

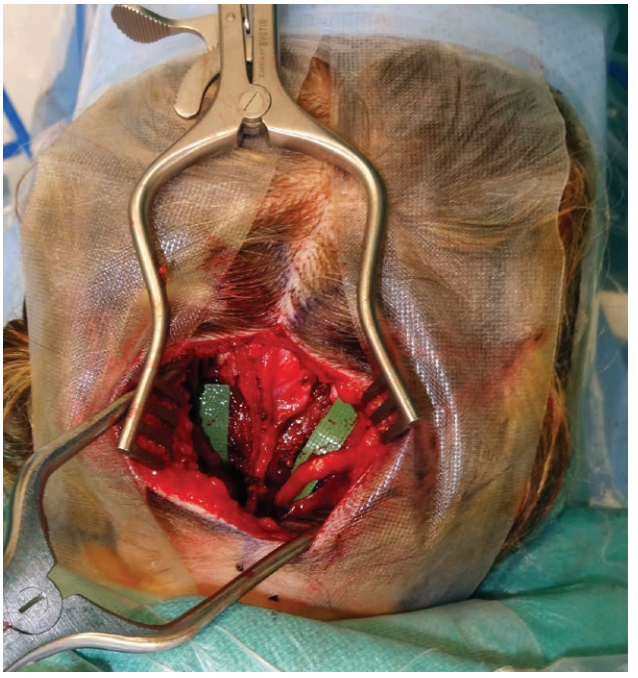

Fig. 4. Intraoperative exposure highlighting the nerves.

RESULTS

A total of 15 patients were identified meeting inclusion criteria (Table 1). All 15 patients underwent decompression of the GON, 13 patients (81%) underwent transection of the TON, 11 patients (69%) underwent neurolysis of the LON, and 2 patients (13%) underwent lipoma excision through the occipital approach. Additionally, 5 patients (31%) underwent surgical treatment at the supraorbital nerve, 4 patients (25%) underwent treatment at the STN, 5 patients (31%) underwent treatment at the zygomaticotemporal branch of the trigeminal nerve (ZGTBTN), and 1 patient (6%) underwent treatment at the auriculotemporal nerve. All patients demonstrated satisfaction in not having their head shaven; however, a formal rubric was not utilized.

In terms of complications, 2 patients (6%) developed surgical-site superficial cellulitis, which was resolved with a standard course of antibiotic therapy. Thirteen of the

Fig. 5. Closure of incision.

15 patients experienced improvements in their headache symptoms with a greater than 5-point reduction in pain on a visual analog scale in the GON distribution. Two of these 13 patients experienced pain in another region of the scalp postoperatively. Two patients continued to experience persistent but decreased pain in the occipital nerve distribution.

DISCUSSION

Consistent with the literature surrounding GON decompression for migraine headaches, our results demonstrate improvement in headache symptoms in the GON distribution similar to previously published reports. In terms of complications, 2 superficial infections occurred which resolved with a single course of antibiotics. Other adverse events associated with migraine decompression surgery including itching, hair loss, and neck stiffness were not observed after the immediate postoperative period. It is not unexpected that some patients noticed pain in other regions of the scalp after decompression of the GON, given that improvement in 1 area may unmask pain in another area; therefore, additional surgical decompression may be necessary.

Table 1. Procedures Performed

Procedure	n (%)
GON decompression	15 (100)
TON transection	12 (80)
LON neurolysis	10 (67)
SON decompression	5 (33)
STN decompression	4 (27)
ZGTBTN decompression	5 (33)
AT decompression	1 (7)
Lipoma excision	2 (13)

AT, auriculotemporal nerve; SON, supraorbital nerve.

Hair is generally removed preoperatively because its presence can interfere with exposure and suturing of the incision. It is also perceived with a lack of cleanliness, with removal often perceived to reduce the risk of SSI. However, the Center for Disease Control guidelines strongly recommend hair not be removed preoperatively unless hair at or around the incision site will interfere with the operation.[8] Additionally, in 2 systematic reviews of preoperative hair removal conducted by Kjønniksen et al.[9] and Tanner et al.[10], there was no statistically significant difference in the risk of SSI between patients who had hair removed and those who did not.

In decompression surgery of the GON, it is generally recommended that the hair over the occiput be shaven or trimmed before the procedure.[6] However, in several cosmetic procedures, hair is generally parted and contained with rubber bands rather than removed. We applied the same strategy to occipital nerve decompression surgery. Given the literature on preoperative hair removal in conjunction with the results presented here, we recommend preservation of the hair during occipital nerve decompression surgery. We demonstrate success using sterile surgical tape and rubber bands in securing hair near the incision site out of the surgical field without interference. In doing so, patients are not subjected to prolonged hair length discrepancies, thus improving patient cosmesis and satisfaction without any observed or theoretical deficits.

CONCLUSIONS

The securing of occipital hair with surgical tape and rubber bands instead of preoperative hair removal is a viable alternative in the surgical approach for GON decompression. The preservation of hair length can lead to better patient satisfaction by avoiding the hair length discrepancies and has demonstrated a low risk of SSI. In future research endeavors, our findings need to be validated with comparative study designs.

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