

Comparison of Targeted Scalp Block Versus Local Infiltration on Awake Deep Brain Stimulation Surgery

BOSSAKARA SOKHOM, HEIDI YOUNG, HANWOOL CHOI
VIRGINIA MASON FRANCISCAN HEALTH

Introduction

- Deep brain stimulation (DBS) surgery is primarily used to treat movement disorders.
- Unique anesthetic technique is needed for patient to be sedated and tolerate rigid headframe placement while able to respond to verbal questioning during surgical exposure.
- Tight hemodynamic control is paramount in order to avoid complications such as subarachnoid hemorrhage.
- We aim to compare the effectiveness of the use of local anesthetic by the surgical team versus a targeted preoperative scalp block by anesthesia providers in the first stage of DBS surgery.

Materials and Methods

- IRB approval was obtained for a retrospective chart review of previous DBS stage 1 cases from December 1st, 2020 to March 1st, 2023.
- Consents obtained as part of anesthesia and surgical consent for procedure.
- 54 cases identified, with 27 from the local anesthetic group (LA) and 27 from the scalp block group (SB).
- Scalp block was performed preoperatively in the induction area following a standard protocol with a total of 16mL of 0.5% bupivacaine. See Figure 1.
- LA group was administered local anesthetic at the pinning sites by the surgical team just prior to pinning and headframe placement.
- We manually collected data from the patient’s electronic anesthesia and medical records and used a two-tailed Welch’s test or Chi square test to test for significance at $p < 0.05$.

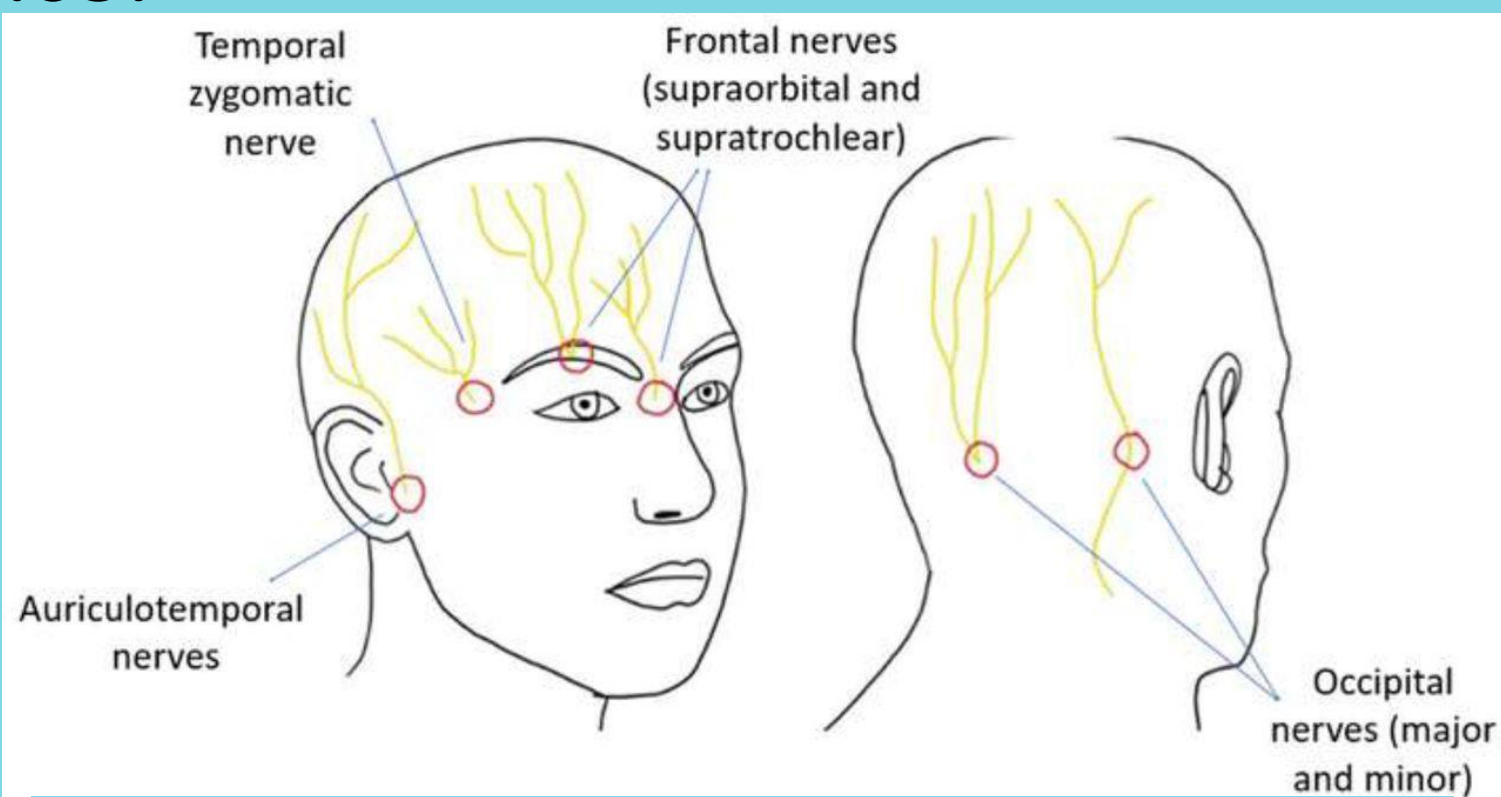


Figure 1 Targets of scalp block

Results

- Table 1 shows baseline patient characteristics.
- Our retrospective data review does not show any significant differences between the scalp block group and the non-scalp block group in terms of perioperative opioid requirement, hemodynamic control or hospital length of stay (Table 2).

Table 1 Baseline patient characteristics

	Scalp block	Non-scalp block	p-value	Test
Age (average)	64.9	64.4	0.96	Welch's t-test
Male (%)	59	59	1	Chi square test
Baseline hypertension (%)	22	56	0.01	Chi square test

Table 2 End points with their significance level

	Scalp block	Non-scalp block	p-value	Test
Total MED (average)	37.7	34.9	0.7	Welch's t-test
Intra-op antihypertensive (average in mg)				
Nicardipine	16.2	8.3	0.04	Welch's t-test
Labetalol	4.3	13.4	0.1	Welch's t-test
Esmolol	0.7	4.2	0.07	Welch's t-test
Metoprolol	0.2	0.9	0.08	Welch's t-test
Hydralazine	0.9	4.56	0.05	Welch's t-test
Post-op antihypertensive				
Nicardipine (%)*	22.2	37	0.2	Chi square test
Labetalol (average)	11.1	11	0.9	Welch's t-test
Esmolol (average)	0	0	**	Welch's t-test
Metoprolol (average)	0	0	**	Welch's t-test
Hydralazine (average)	3.7	6.6	0.4	Welch's t-test
Length of stay	0.9	1.2	0.09	Welch's t-test

Discussion

- We do not observe significant differences in hospital length of stay, opioid requirement, and antihypertensive medication use between the scalp block group and those with local anesthetic group.
- However, in other studies, scalp blocks have led to less opioid use, antiemetic requirement, and overall better patient satisfaction (1-5).
- Results from our study are limited by its retrospective nature, small sample size, and lack of standardization for intra-op and post-op care relating to opioid and antihypertensive administration.
- Nonetheless, the pragmatic nature of the anesthetic course in our study provides important understanding for future randomized, controlled trials to avoid any potential bias given the variable conclusions in the current literature.

References

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