



## Hypotensive Anaesthesia In Skull Base Surgeries – Our Experience

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### KEYWORDS

### ABSTRACT:

Endoscopic surgery is a technique that can be used in all fields of surgery. From simple endonasal procedures to complex skull base approaches, it can be used in multiple scenarios. It has major advantages by avoiding external scars, decreasing normal tissue damage, and providing a better recovery time and duration of hospital stay. Even then, intra-op bleeding is a big hindrance to endoscopic visualization of surgical field. Blood reduces the view of the surgical field and blurs the endoscope lens hence causing difficulty in visualising the field of surgery. This can lead to the risk of complications which range from brain injury, orbital or optic nerve injury, and injury to major vessels. In such cases the use of Hypotensive anaesthesia is a valid modality as it maintains the patient at a low blood pressure and thus reducing the chances of intra-op and post-op bleeding and provides a clear surgical field and also helps the patient for a better recovery. Hypotension can induced using different range of drugs with each one having its advantages and disadvantages. Thus this study aims at observing the effects of hypotensive anaesthesia in patients undergoing skull base surgery and its effect on intra op and post op bleeding, recovery and the need for antihypertensives.

### INTRODUCTION:

There has been a massive increase in basal skull surgeries in the recent past. The skull base is a bony vault that separates the brain from the facial structures and the neck. A lesion may be intracranial or extracranial, or both and can be accessed through the base of skull. Endoscopic basal skull surgeries are among those surgeries that commonly require hypotensive anaesthesia. Using this method of induced hypotension we can maintain a controlled and safe reduction in the arterial blood pressure (BP) while preserving organ perfusion as well. It is one of the major concerns of every head and neck surgeon to identify the complex anatomy and hence make sure a clear, bloodless operative field is maintained, which is obtained by controlled hypotension. The need for antihypertensive drugs is also automatically reduced as blood pressure is maintained at a desired level.

### CASE HISTORY:

We treated 35 cases requiring basal skull surgeries. Patients presented to the ENT OPD with Nasal Discharge(watery), Giddiness, Hard of Hearing, Headache, Facial Weakness. Detailed History taking and clinical examination was done. Tuning fork tests, Audiometry, Diagnostic Nasal Endoscopy(DNE), CT-cisternography, MRI-Brain, CT-Brain were done to get a better understanding of the anatomy and extent of the lesion/defect. Patients with appropriate findings were candidates for skull base surgery. Most of these conditions were benign lesions. Conditions included CSF Rhinorrhea(Spontaneous and Traumatic), Acoustic Neuroma, Pituitary adenoma, Glomus tumour and Aneurysms. The common presenting symptoms included watery nasal discharge and giddiness.



Figure 1: Case 1

A 35 year old female presented to the OPD with complaints of watery nasal discharge for the past 2 months which could not be sniffed back. There was no history of trauma, nasal bleed, giddiness, seizures, fever. There were no signs of raised intracranial tension. On examination, Teapot sign was elicited. Diagnostic Nasal Endoscopy was done and patient was advised CT-Cisternogram (figure 1) which showed a defect in the

cribriform plate. Pre-Anaesthetic fitness was obtained and patient was taken up for Transnasal Endoscopic Repair under general anaesthesia. The defect was visualised and closed using the 5 layer technique which consisted of Muscle, Cartilage, Fat, Fascia and Gel foam. Intra-op and Post op Period was uneventful and patient was symptomatically better post op.

## CASE 2

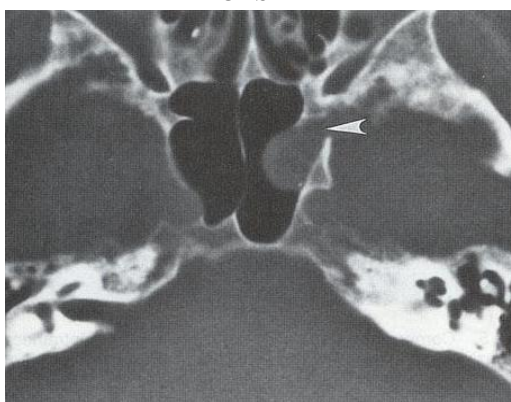


Figure 2: CSF Rhinorrhea showing defect on the left.

## CASE 3

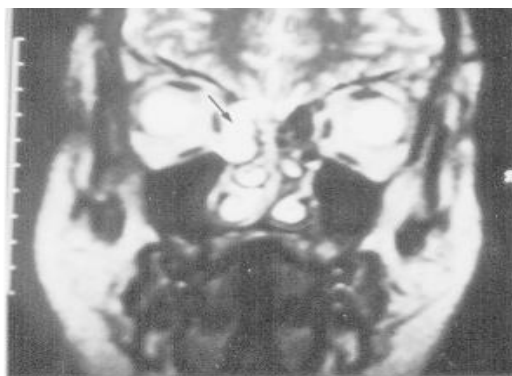


Figure 3: CSF Rhinorrhea with defect

## CASE 4

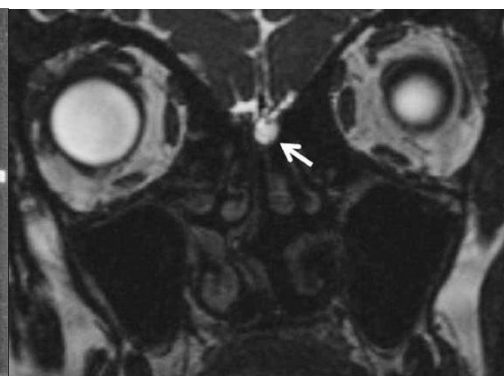


Figure 4: CSF Rhinorrhea- cribriform plate defect on the right



## CASE 5



Figure 5: MRA showing glomus      Figure 6: CT Temporal bone

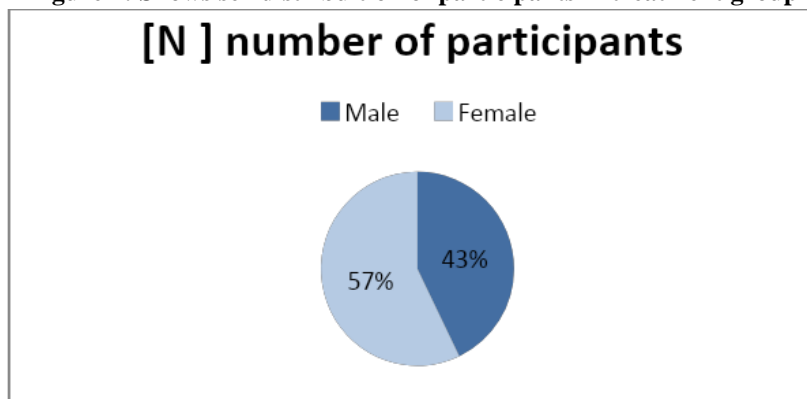
**DISCUSSION:**

Hypotensive anaesthesia can be induced using various anti-hypertensive drugs. All the patients undergoing procedure were made sure there were no contraindications of controlled hypotension such as pregnancy, Cardiac conditions, Hematological diseases, severe lung disease, etc. Pre-operative vitals were recorded. Oxygen saturation, Blood pressure, Pulse rate, Respiratory rate and Temperature was closely monitored throughout the procedure and even post-operatively. Complications of Rebound Hypertension and reactionary haemorrhage were closely looked for. All

the patients had a constant and stable haemodynamic status intra-opas well as during recovery. The operative field was clear and hence provided lesser chance of errors and blood loss<sup>3</sup>. Also, since the blood pressure was maintaining at a lower level, hence the need of additional anti-hypertensives was also avoided. The Bleeding severity score was observed to be in the range of 1-3 in patients induced using hypotensive anaesthesia. Their pre-op and post-op vitals were also observed to be well controlled. Patients were also well sedated and calm pre-operatively. Extubation was also faster in these patients and their post-op recovery was smooth.

**Table 1: Shows sex distribution of participants in treatment group:**

Gender	[N ] number of participants
Male	15
Female	20

**Figure 1: Shows sex distribution of participants in treatment group****Table 2: shows the frequency of diagnosis for the participants:**



Diagnosis	Frequency
Spontaneous csfrhinorrhea	4
Traumatic csfrhinorrhea	4
Glomus tumor	5
Pituitary adenoma	8
Acoustic neuroma	7
Intracranial aneurysm	7

Figure 2: shows the frequency of diagnosis for the participants

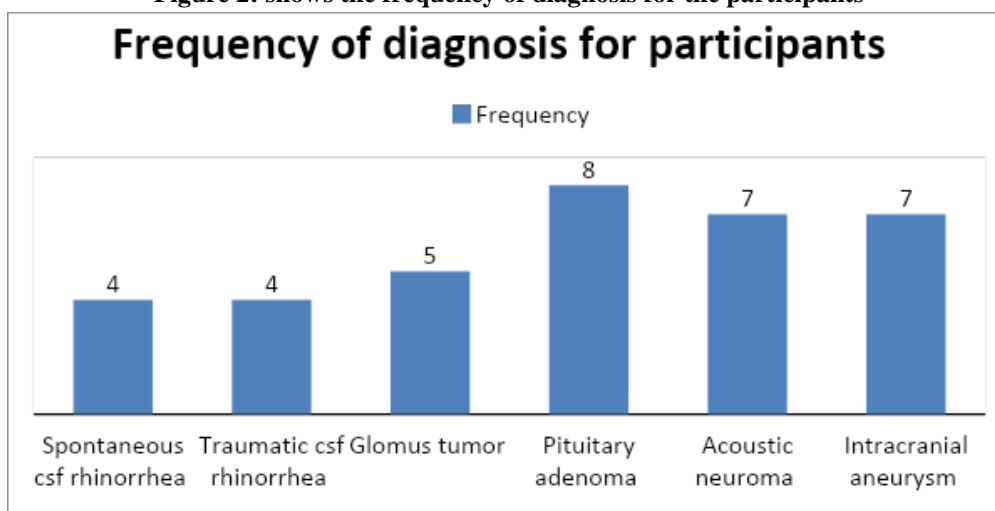


Table 3: shows the mean, SD, and range for pulse rate, respiratory rate and temperature in preop and postop participants.

Vital parameters	Pre op status			Post op status		
	mean	SD	Range	Mean	SD	Range
Pulse rate	83.687bpm	12.64	65-107	76.6bpm	11.76	60-96
Respiratory rate	13.55 breaths/min	1.167	12-16	13.64 breaths/min	1.189	12-16
Temperature	36.86 degcelsius	6.17	34.6-40	37.08deg Celsius	6.54	34.6-42



Figure 2: Distribution of mean values in vital parameters

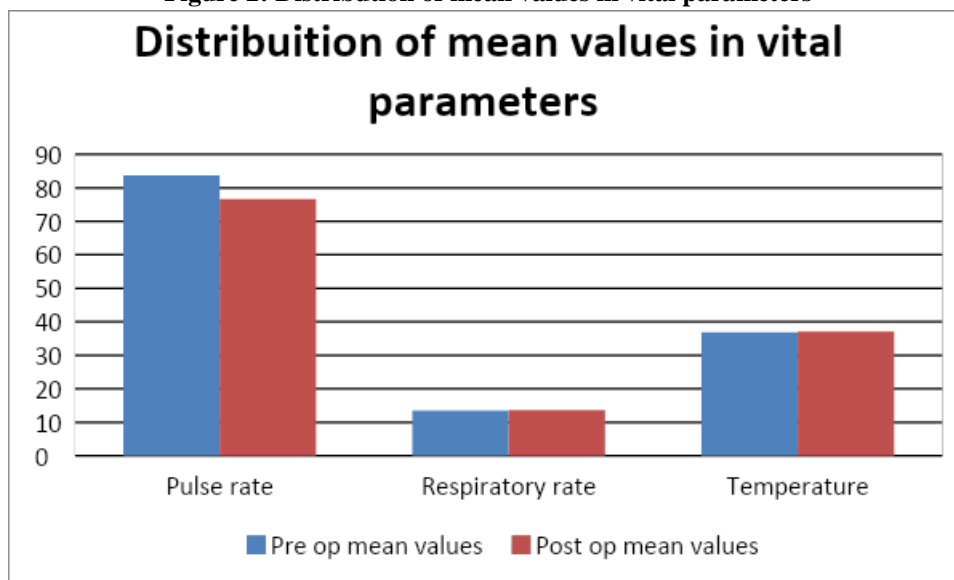


Table 4: shows the mean range and p value (test of significance) for bp and bleeding severity score in participants

BP	Mean	Range	Pvalue
Pre op	120.4-79.26 mmhg	100-60_138- 92mmhg	<0.0001
Intra op	105.85-79.05mmhg	94-70_129-89 mmhg	
Post op	106.7-78.83mmhg	94-129_70-89mmhg	
Bleeding severity score	1.91	1-3	<0.0001

The Bleeding severity score was observed to be in the range of 1-3 in patients induced using hypotensive anaesthesia. Their pre-op and post-op vitals were also observed to be well controlled. Patients were also well sedated and calm pre-operatively. Extubation was also faster in these patients and their post-op recovery was smooth<sup>4,1</sup>. Thus the advantages of Hypotensive Anaesthesia are known to be as an excellent sedative, easy intubation, Maintaining cardiac status intra-op and post op, providing good analgesia. Side effects are also seen to be lower and it can be administered easily. There are also contraindications and limitations to controlled hypotension and therefore the patients have to be chosen carefully before planning the surgery. Administering hypotensive anaesthesia in patients of skull base surgery greatly helped in controlled hypotensive and helped provide a clear operating field.

### CONCLUSION:

This study shows that Hypotensive anaesthesia helps in achieving a good and clear operative field of surgery with great reduction in bleeding during Endoscopic

Skull Base Surgeries. It also reduces the requirement of other hypotensive drugs. Patients were observed to have better post op recovery, reduced post-op pain much lesser duration of hospital stay. Therefore Hypotensive Anaesthesia can be used for bleeding control as well as a hypotensive agent during Skull Base Surgery<sup>1</sup>.

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