# **Semisitting position**

- Prevention of aspiration pneumonia recurrences
- Comparing surgical outcomes of the semisitting versus lateral position in large vestibular schwannoma surgery: a randomized clinical trial
- Impact of patient positioning on bleeding rate in stereotactic brain biopsies: semi-sitting versus supine position
- Anesthesiology Considerations and Management of Venous Air Embolism in Patients in the Semisitting Position: A Single-Center Review
- Diverse accessory techniques and working corridors to enhance the retrosigmoid approach: a versatile option for the treatment of meningiomas of the petroclival region
- Airway management and ventilation strategy among obese adult patients: a comprehensive review and analysis
- A Bibliometric Analysis of Sitting Position and Air Embolism in Neurosurgery: Top 100 Most Cited Articles
- The microsurgical infratentorial supracerebellar approach for lesions of the pineal gland: feasibility, morbidity, and functional outcomes from a single-center experience

Semi-sitting positioning seems to be associated with an improved facial nerve outcome after VS surgery via the retrosigmoid approach. Venous air embolisms are significantly more often observed among VS patients who underwent surgery in the sitting position, but the perioperative mortality is equal in both positioning groups. Both positioning groups are a safe procedure. Multicentric prospective randomized trials are needed to evaluate the risk-benefit ratio of each positioning in VS surgery via the retrosigmoid approach <sup>1)</sup>.

Initially, when the patient is in a supine position on the operative table, its legs should be dressed with anti-thrombotic socks. The articular body edges should be protected, especially the knees, hips, elbows, and ankles.

The head should be supported by a (three or four-pin) skull fixation device (Mayfield or Sugita). The pins should be placed on both sides of the superior temporal line, always avoiding placing them through temporal muscles.

While moving up the table headboard, the neurosurgeon should support the skull fixation device in order to place the head as looking straightly forward, the shoulders must be at the same level parallel to each other and the head inflected until the chin reaches a one-finger distance, approximately 3 cm, from the chest.

The neurosurgeon should pay great attention to the jugular veins in order to avoid compression of them, which would cause a venous return impairment and brain swelling, therefore.

To achieve a semi-sitting position the headboard should be tilted up until a maximum of sixty degrees. The operative table's main body may be in Trendelenburg and legs may be elevated in order to place the knees semi-flected. Nonetheless, a total sitting position may be avoided once long time procedures on this position might cause sciatic and fibular nerve palsy.

The head flexion objective is aim a better exposition of the cerebellum tent and a better anatomical exposition of the occipital-cervical muscles, which may be tense at this position.

## Advantages

The semisitting position of a patient confers numerous advantages in various neurosurgical procedures, but venous air embolism is one of the associated complications of thisposition. Till 2018 no prospective studies of the relationship between the degree of head elevation and the rate and severity of venous air embolism for patients undergoing a procedure in this position have been performed.

The most essential benefits of the semisitting position are gravitational CSF drainage and blood of the surgical area, creating an unobstructed corridor between the cerebellum and the tentorium cerebelli without the need for cerebellar retraction and allowing twohanded microsurgical dissection. All these benefits are related to the intradural part of the surgery. However, the risk of venous air embolism exists at all stages of surgery, including during the application and removal of 3-pin head holder. Using the dynamic lateral semisitting position, Ture et al. aim to reduce the risk of VAE by keeping the patient in the lateral decubitus position during the dural and extradural phases of the surgery, which are at higher risk of VAE. The patient can be easily placed into the lateral semisitting position with a single move in the intradural phase of the surgery to take advantage of the benefits of the semisitting position <sup>2</sup>

### **Head elevation**

Türe et al. compared changes in the severity ofvenous air embolism according to the degree of head elevation (30° or 45°) in patients undergoing an elective cranial neurosurgical procedure in the semisitting position. One hundred patients undergoing an elective infratentorial craniotomy in the semisitting position were included, and each patient was assigned to 1 of 2 groups. In Group 1, each patient's head was elevated 30° during surgery, and in Group 2, each patient's head elevation was 45°. Patients were assigned to their group according to the location of their lesion. During surgery, the standard anesthetic protocol was used with total intravenous anesthesia, and transesophageal echocardiography was used to detect air in the blood circulation. Any air embolism seen on the echocardiography screen was classified as Grade 0 to 4. If multiple events occurred, the worst graded attack was used for statistical analysis. During hemodynamic changes caused by emboli, fluid and vasopressor requirements were recorded. Surgical and anesthetic complications were recorded also. All results were compared statistically, and a p value of < 0.05 was considered statistically significant. There was a statistically significant difference between groups for the total rates of venous air emboli detected on transesophageal echocardiography (22.0% [n = 11] in Group 1 and 62.5% [n = 30] in Group 2; p < 0.0001). The rate and severity of air embolism were significantly lower in Group 1 than in Group 2 (p < 0.001). The rates of clinically important venous air embolism (Grade 2, 3, or 4, venous air embolism with decreased end-tidal carbon dioxide levels and/or hemodynamic changes) were 8.0% (n = 4) in Group 1 and 50.0% (n = 24) in Group 2 (p < 0.0001). There was no association between the rate and severity of venous air embolism with patient demographics (p > 0.05). An association was found, however, between the rate of venous air embolism and the type of surgical pathology (p < 0.001); venous embolism occurred more frequently in patients with a meningioma. There were no major surgical or anesthetic complications related to patient position during the postoperative period.

For patients in the semisitting position, an increase in the degree of head elevation is related directly to a higher rate of venous air embolism. With a 30° head elevation and authors standardized technique of positioning, the semisitting position can be used safely in neurosurgical practice <sup>3)</sup>

### Lateral semisitting position

Lateral semisitting position

#### Complications

#### Postoperative pneumocephalus after posterior fossa surgery

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3)

Vychopen M, Arlt F, Güresir E, Wach J. How to position the patient? A meta-analysis of positioning in vestibular schwannoma surgery via the retrosigmoid approach. Front Oncol. 2023 Feb 1;13:1106819. doi: 10.3389/fonc.2023.1106819. PMID: 36816965; PMCID: PMC9929142.

Durmuş YE, Kaval B, Demirgil BT, Gökalp E, Gurses ME, Varol E, Gonzalez-Lopez P, Cohen-Gadol A, Gungor A. Dynamic Lateral Semisitting Position for Supracerebellar Approaches: Technical Note and Case Series. Oper Neurosurg (Hagerstown). 2023 May 31. doi: 10.1227/ons.0000000000000758. Epub ahead of print. PMID: 37255298.

Türe H, Harput MV, Bekiroğlu N, Keskin Ö, Köner Ö, Türe U. Effect of the degree of head elevation on the incidence and severity of venous air embolism in cranial neurosurgical procedures with patients in the semisitting position. J Neurosurg. 2018 May;128(5):1560-1569. doi: 10.3171/2017.1.JNS162489. Epub 2017 Jul 14. PMID: 28707996.

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