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 ¹⁾

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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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