
**EFFECT OF ANTERIOR NASAL PACKING ON MIDDLE EAR
PRESSURE IN PATIENTS UNDERGOING SEPTOPLASTY AND
FUNCTIONAL ENDOSCOPIC SINUS SURGERY IN TERTIARY CARE
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ABSTRACT

Background: Nasal surgery patients are often treated with anterior nasal packing after surgery in order to help control bleeding. Complete nasal obstruction is a result of this treatment and could disrupt normal functioning of the Eustachian tube. Inflammation and swelling of the nasopharynx as a result of nasal packing can also cause an inability to open the Eustachian tube because of inflammation surrounding the Eustachian tubes, decreased lymphatic flow and mechanical obstruction of the tube. Although previous studies have shown changes in middle ear pressure with nasal packing, little information has been found regarding short-term (24-hour) nasal packing and what the expected full recovery is for patients who experience these changes. A better understanding of how and when nasal packing will affect the Eustachian tube is necessary to provide adequate counseling to the patient and identify safe methods of nasal packing for use in the future.

Methodology: This prospective study for observation was carried out at a major medical facility between 2024-2025. There were thirty patients of either gender and of any age undergoing nasal surgery that required an anterior nasal packing; all thirty were studied. The middle ear pressure of each patient was measured by tympanometry at three different times: before surgery, 24 hours later when an anterior nasal pack was still in place, and seven days after the pack had been removed (six days after). Normal middle ear pressure was defined as being between -100 and +100 daPa. Tympanometry patterns were classified as follows: type A = normal tympanogram; type B = flat tympanogram; type C = negative pressure tympanogram. Paired t-tests were used to perform statistical analyses and a p-value less than .05 was used to determine if results were statistically significant.

Results: The average pressure of the middle ear was -5.5 ± 30.14 daPa before surgery, and this was a statistically significant reduction (-76.5 ± 58.8 daPa) at 24 hours after nasal packing ($p < .01$). Twenty-three of sixty ears (38%) were found to have abnormal middle ear pressures (less than -100 daPa). Fifty percent of ears (30 of 60) had a type "C" tympanometric curve by 24 hours after surgery; twenty-three of thirty had an asymmetrical presentation (left = 23, right = 7). On postoperative day seven, the average middle ear pressure returned to -12.4 ± 36.5 daPa, which was no longer statistically different from the preoperative values ($p = .34$). One hundred percent of the patients were completely recovered

as indicated by type "A" tympanograms. The differences between the 24-hour and day-seven readings were highly statistically significant ($p < .01$).

Conclusion: Anterior nasal packing for 24 hours caused significant but fully reversible Eustachian tube dysfunction with a decrease in middle ear pressure in 38% of patients. All patients had both middle ear pressure and tympanometric results that returned to normal by the seventh post-operative day. This supports that 24 hour anterior nasal packing is safe as it has predictable, self-limiting effects on Eustachian tube function. Therefore, all patients can be assured that their temporary ear-related symptoms will completely resolve without the need for further intervention by one week.

Keywords Anterior nasal packing, Middle ear pressure, Eustachian tube dysfunction, Tympanometry, Nasal surgery, Septoplasty, Post-operative complications, Otologic complications, Impedance audiometry, Nasopharyngeal edema