

Military Institute of Aviation Medicine



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**The effect of nasal irrigation with warm 0,9% sodium chloride solution on hemostasis and surgical field visibility during functional endoscopic sinus surgery**

*Doctoral dissertation for the degree of Doctor of Medical Sciences*

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## Summary

Chronic rhinosinusitis (CRS) is a persistent inflammatory condition of the nasal and paranasal sinus mucosa. According to the EPOS 2020 guidelines, the diagnosis of CRS in adults is based on the presence of at least two symptoms, one of which must be either nasal obstruction or nasal discharge (anterior or posterior). Additional symptoms include facial pain or pressure and a reduction or loss of sense of smell. CRS is treated conservatively using intranasal corticosteroids (and occasionally systemic corticosteroids), antibiotics, antihistamines in cases of allergy, and nasal irrigation with isotonic or hypertonic sodium chloride solutions. In patients who do not achieve adequate disease control with conservative therapy, surgical intervention is indicated. The aim of surgery is to restore physiological drainage pathways and to improve nasal ventilation.

Functional Endoscopic Sinus Surgery (FESS) is considered a safe procedure; however, excessive intraoperative bleeding remains a significant challenge for surgeons performing endoscopic interventions in the nasal cavity, as it may compromise surgical precision and patient safety. Various methods have been explored to optimize operative field visibility and reduce blood loss, including pharmacologic agents, anesthetic techniques, and intraoperative irrigation with warmed saline solutions.

This study aimed to evaluate the effect of intraoperative irrigation using warmed 0.9% sodium chloride solution on surgical conditions during FESS. The study was conducted at the Military Institute of Aviation Medicine between March and December 2023. Patients meeting predefined clinical criteria were included and assigned to experimental groups (irrigation with 0.9% NaCl at 50°C or 22°C) or a control group (no irrigation).

During surgery, several parameters were assessed: volume of irrigation fluid used, blood loss, procedure duration, and operative field visibility as rated by the Boezaart scale. Additionally, hemodynamic parameters were monitored, and the clinical effectiveness of the intervention was evaluated using the SNOT-22 questionnaire.

The results demonstrated that irrigation with 0.9% NaCl at 50°C significantly reduced intraoperative bleeding and improved surgical field visibility. These differences were statistically significant and correlated with Boezaart scale scores. Furthermore, the severity of inflammatory changes as assessed by the Lund-Mackay scale and the presence of nasal polyps were independent factors associated with increased bleeding. Preoperative administration

of enoxaparin for thromboembolic prophylaxis did not negatively affect surgical outcomes.

In conclusion, intraoperative irrigation with 0.9% NaCl at 50°C is an effective method for improving surgical conditions during FESS by reducing bleeding and enhancing visibility. This technique may serve as a valuable adjunct for surgeons performing precise sinus interventions.