INNOVATIONS IN ENT SURGERY WITHIN RESOURCE-CONSTRAINED ENVIRONMENTS

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Introducrion

Surgical missions in low- and middle-income countries (LMICs) often struggle to maintain high standards of otolaryngology (ENT) care due to limited infrastructure. The adoption of modern portable technologies, specifically Point-of-Care Ultrasonography (POCUS) and piezoelectric surgery, offers transformative potential. While POCUS enables real-time diagnostics in areas with restricted imaging access, piezosurgery provides a precise, low-trauma alternative to traditional mechanical tools (drills and chisels), significantly reducing the risks of thermal damage and intraoperative bleeding.

Objective

To evaluate the clinical efficacy and safety profile of piezoelectric instruments (piezotomes) in rhinosurgery, and to refine surgical protocols for septoplasty and maxillary sinus procedures.

Materials and Methods

A clinical evaluation was conducted at Samarkand State Medical University involving 25 patients (15 septoplasties and 10 cystectomies). The study compared piezotomes against conventional surgical instruments, measuring the following parameters:

- Intraoperative blood loss (assessed via the Fromme-Boezaart scale).
- Precision of bone manipulation.
- Total operative time.
- Data analysis was performed using Stata 18 software.

Results of the research

The findings indicated a statistically significant reduction in intraoperative hemorrhage when using the piezotome. The technology provided:

1. Superior Control: Enhanced precision during osteotomy and reduced vibration, effectively protecting adjacent soft tissues.
2. Safety: A markedly lower traumatic impact compared to standard techniques.
3. Observation: Although the integrated irrigation system requires continuous aspiration, the overall clinical benefits outweigh this requirement.

Conclusion

The integration of ultrasound technologies—for both diagnostics and surgery—represents a major advancement in otorhinolaryngology. Piezosurgery, though more recently adapted to sinus interventions than to dentistry, demonstrates clear advantages in surgical safety and the minimization of blood loss.

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