The Journal of Laryngology & Otology

cambridge.org/jlo

Bioabsorbable steroid-eluting implants for mucosal graft fixation in Draf III frontal sinus surgery

Guled M. Jama, Faaizah Chishty, Catherine E. Rennie, Hesham Saleh and William E. Grant

Department of Otolaryngology, Charing Cross Hospital, Imperial College Healthcare NHS Trust, London, UK

Abstract

Objectives. The modified endoscopic Lothrop (Draf III) procedure requires reliable mucosal coverage of the exposed bone within the frontal neo-ostium to prevent post-operative restenosis. Free mucosal grafts are effective but difficult to secure due to limited access and absent anchoring sites. We describe a novel use of bioabsorbable steroid-eluting implants as a pragmatic approach to achieve mucosal graft fixation.

Methods. Following completion of a Draf III frontal sinusotomy, a PROPEL™ implant is deployed over a free mucosal graft within the frontal neo-ostium. Endoscopic assessment is performed at standard post-operative intervals.

Results. In our experience, the technique provides mechanical stabilisation and local steroid delivery and is associated with visually satisfactory graft apposition and mucosalisation in the post-operative period.

Conclusion. The use of bioabsorbable steroid-eluting implants offers a practical and complementary endoscopic adjunct in patients undergoing Draf III frontal sinus surgery, supporting graft fixation and contributing to improved long-term neo-ostium patency.

Short Communications

Guled M. Jama takes responsibility for the integrity of the content of the paper

Cite this article: Jama GM, Chishty F, Rennie CE, Saleh H, Grant WE. Bioabsorbable steroid-eluting implants for mucosal graft fixation in Draf III frontal sinus surgery. *J Laryngol Otol* 2026; **140**:800–802. https://doi.org/10.1017/S0022215126104848

Received: 5 December 2025
Revised: 24 March 2026
Accepted: 14 April 2026
First published online: 30 April 2026

Keywords:
absorbable implants; drug-eluting stents; endoscopy; frontal sinus; paranasal sinus diseases

Corresponding author: Guled M. Jama; Email: guled.jama@nhs.net

Introduction

The modified endoscopic Lothrop (Draf III) procedure is a well-established technique for managing refractory frontal sinus disease, providing wide access and drainage via creation of a common frontal neo-ostium.[1] Achieving reliable mucosal coverage of the exposed bone within this cavity is critical to optimise healing, promote mucosalisation and minimise the risk of restenosis.[2] Free mucosal grafts are often employed for this purpose, offering effective epithelialisation, protection of underlying bone and reduction in post-operative scarring.[3] However, their fixation within the frontal neo-ostium can be technically challenging given the limited access, irregular surfaces and the absence of stable anchorage points, which may lead to graft displacement and impaired integration.[4] We describe the utility of bioabsorbable steroid–eluting implants as a novel application to provide mechanical support, facilitating secure fixation and enhanced integration of free mucosal grafts within the frontal neo–ostium. This report outlines the technical steps and our experience with this approach as a practical description, rather than a formal comparative outcomes study with quantitative data.

Technical description

Following creation of a wide frontal neo-ostium via a Draf III frontal sinusotomy, haemostasis is achieved within the exposed bony cavity. The recipient site is inspected, and any residual debris is gently cleared. Donor mucosa is harvested from the nasal septal window or inferior turbinate and trimmed to fit the dimensions of the denuded bone within the frontal neo-ostium (Figure 1). The free mucosal graft is carefully positioned over the exposed bone, ensuring full contact between its undersurface and the recipient bed and extending to the margins of the neo-ostium. To stabilise the graft and prevent displacement, a bioabsorbable steroid-eluting implant (PROPEL™, Medtronic Limited, Watford, UK) is deployed over the graft within the neo-ostium. The implant is positioned to achieve even, low-pressure apposition, securing the graft without excessive compression or folding (Figure 2A).

Patients receive standard post-operative care, including saline nasal irrigations and intranasal corticosteroid drops. Systemic antibiotics are prescribed only when clinically indicated.

© The Author(s), 2026. Published by Cambridge University Press on behalf of J.L.O. (1984) LIMITED.

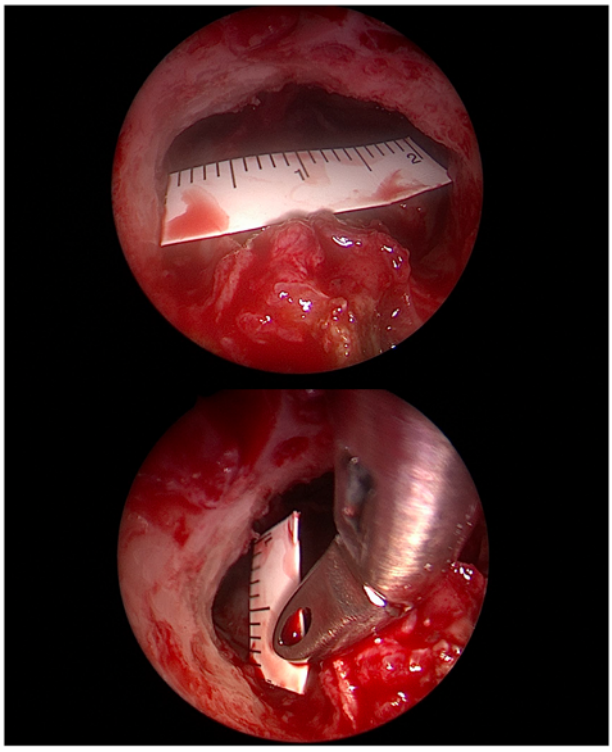


Figure 1. Intraoperative measurement of the dimensions of the denuded frontal neo-ostium following completion of the modified endoscopic Lothrop procedure.

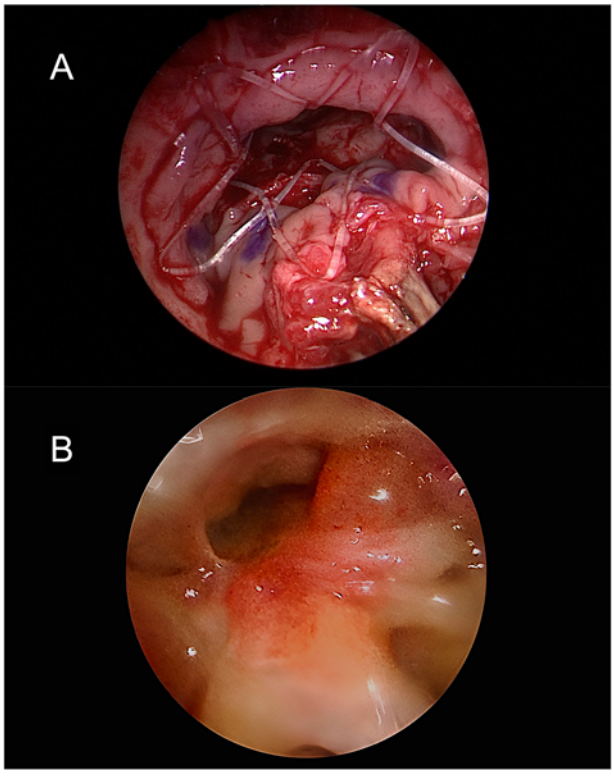


Figure 2. (A) Deployment of a PROPEL™ Contour implant over a free mucosal graft providing even apposition within the frontal neo-ostium. **(B)** Long-term results at 2 years showing a patent, fully mucosalised neo-ostium with stable integration of the graft and mild polypoid changes.

No additional packing or non-bioabsorbable stenting material is used in the frontal neo-ostium. Patients are typically reviewed at three weeks, three months and six months post-operatively, with endoscopic evaluation to monitor healing, graft integration and mucosalisation. Further follow-up is scheduled according to clinical need (Figure 2B).

The described technique eliminates the need for complex packing or suturing, which can be impractical in the confined and irregular geometry of the frontal neo-ostium. The PROPEL™ implant gradually releases mometasone furoate (370 µg), providing sustained corticosteroid delivery to the surgical site for a period of approximately 30 days and fully degrading within 30–45 days. Beyond drug delivery, the implant functions as a temporary scaffold that stabilises the mucosal graft during the critical early healing phase. Its lightweight, self-expanding structure incorporates a flexible spring-like mechanism that allows gentle outwards pressure to maintain consistent apposition of the graft against the recipient bed. It supports graft immobilisation, reduces postoperative inflammation and fibrosis and facilitates progressive re-epithelialisation as the material resorbs.

An alternative method of graft immobilisation may be the use of fibrin sealants such as TISSEEL™ (Baxter Healthcare Ltd, Newbury, UK), which can enhance graft adhesion, although direct application in the frontal recess may pose technical challenges due to difficulty in access. Meanwhile, a PROPEL™ implant, with its purpose-designed delivery system, allows controlled deployment under direct endoscopic visualisation and may be preferred when controlled, self-expanding scaffolding with concomitant anti-inflammatory effects are desired.

The current technique appears to reduce restenosis and support durable neo-ostium patency, in keeping with contemporary reconstructive principles that emphasise mucosal preservation and minimally traumatic healing following Draf III surgery, while also complementing previously published work describing the use of pedicled flap-based reconstruction approaches.[5] In the United Kingdom, the typical NHS unit cost of a PROPEL™ implant is approximately £580 per device, subject to local procurement arrangements, and this represents an important consideration when selecting patients and planning resources for complex frontal sinus surgery.

What is already known:

- The modified endoscopic Lothrop (Draf III) procedure is an established technique for refractory frontal sinus disease and creates a common neo-ostium for improved drainage
- Reliable mucosal coverage of the exposed bone within the neo-ostium is crucial for healing, mucosalisation and minimising restenosis risk
- Free mucosal grafts are commonly used but can be difficult to fixate due to lack of stable and reliable anchoring points, leading to potential graft displacement and poor integration
- Previous methods for graft fixation include complex packing, suturing and use of pedicled flaps, which may be impractical or technically demanding

What this paper adds:

- Introduces a novel, pragmatic technique using bioabsorbable steroid-eluting implants for secure fixation of free mucosal grafts within the frontal neo-ostium
- Highlights the potential added benefit of sustained localised anti-inflammatory effects from the steroid component, which may enhance graft mucosalisation and reduce restenosis

https://doi.org/10.1017/S0022215126104848 Published online by Cambridge University Press

- Avoids the need for additional packing or suturing, simplifying the procedure and making it suitable for select endoscopic frontal sinus surgery cases
- Suggests that this technique can promote reliable graft integration and durable neo-ostium patency, potentially optimising long-term outcomes for patients

Conclusion

Bioabsorbable steroid-eluting implants represent a practical solution for stabilising free mucosal grafts in Draf III frontal sinus surgery, addressing the technical challenges of graft fixation within the neo-ostium. The technique provides both mechanical support and targeted anti-inflammatory effects, promoting reliable mucosalisation and potentially reducing restenosis risk without the complexity of packing or suturing. This simple, reproducible approach complements existing reconstructive strategies and may help optimise long-term outcomes for selected patients undergoing endoscopic modified Lothrop procedures.

Funding. Not applicable.

Competing interests. H.S. has delivered lectures sponsored by Intersect ENT and Medtronic. The present manuscript is an independent analysis, with no commercial involvement in the design, data collection, analysis, interpretation or preparation. All other authors declare no competing interests.

Ethical approval and informed consent. This work did not require ethical review and approval in accordance with local institutional requirements. Individual patient consent was waived due to the analysis of anonymised clinical data.

References

1 Shih L-C, Patel VS, Choby GW, Nakayama T, Hwang PH. Evolution of the endoscopic modified Lothrop procedure: a systematic review and meta-analysis. *Laryngoscope* 2018;**128**:317–26
2 Ye T, Zhou B, Li C, Zhang X, Shao Y, Huang Q, *et al*. Mucosal flaps prevent neo-osteogenesis after frontal drill-out procedures: a computer-assisted study. *Laryngoscope Investig Otolaryngol* 2023;**8**:816–23
3 Lein A, Liu DT, Knerer B, Mueller CA, Rotter N, Vyskocil E, *et al*. Mucosal grafts and flaps in Draf IIb and Draf III: a systematic review and meta-analysis. *Otolaryngol Head Neck Surg* 2025;**173**:1079–91
4 Wang Y-P, Shen P-H, Hsieh L-C, Wormald P-J. Free mucosal grafts and anterior pedicled flaps to prevent ostium restenosis after endoscopic modified Lothrop (frontal drillout) procedure: a randomized, controlled study. *Int Forum Allergy Rhinol* 2019;**9**:1387–94
5 Zheng H, Huang S-P, Wang X-Y, Liu Q-H, Chen Y, Ye Q. Novel triple-pedicled mucoperiosteal flaps in reconstruction of neo-ostium after Draf III frontal sinusotomy for refractory frontal sinusitis. *Int Forum Allergy Rhinol* 2022;**12**:1321–4

https://doi.org/10.1017/S0022215126104848 Published online by Cambridge University Press