

Temporal-parietal fascia and polydioxanone plates (PDS), the solution for septal perforations?

Original Article

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Abstract

Septal perforations remain a surgical challenge, prompting the development of new approaches and techniques to optimize closure rates. When symptomatic, perforations can cause nasal obstruction or recurrent epistaxis, requiring treatment. This study reports two clinical cases of symptomatic septal perforations.

Objective: To describe the diagnosis, treatment, and surgical outcomes, accompanied by photographic follow-up records, and compare the results with existing literature.

Materials and Methods: Two patients underwent surgery using a combination of 0.25mm polydioxanone (PDS) plates and temporoparietal fascia.

Results: Both cases were successfully treated using a closed approach with a right hemitransfixion incision and a combined PDS and temporoparietal fascia graft. It was achieved a complete closure of the perforations and resolution of symptoms.

Conclusion: The combined technique of PDS and temporoparietal fascia demonstrated high efficacy, suggesting its usefulness in treating symptomatic septal perforations.

Keywords: nasal septal perforation, polydioxanone, surgery

Introduction

Septal perforations can result from trauma, iatrogenic causes, chronic inflammation, vasoconstrictive substance abuse, and infections, among others.¹ The estimated prevalence of septal perforation is 1–2% in the general population.² However, the actual number of affected individuals may be underestimated, as most cases are asymptomatic.

The main symptoms of septal perforation are nasal obstruction, recurrent epistaxis, nasal crust formation, and whistling sounds.^{1,2}

Initial medical management consists of regular cleaning and hydration of the nasal cavity, while avoiding excessive manipulation.² If symptoms persist, surgical intervention should be considered.

Multiple techniques have been described for the closure of septal perforation. These include mucosal flap advancement techniques based on the anterior ethmoidal or greater palatine artery, rotational flaps using the mucosa from the nasal floor and inferior turbinates, and approaches with or without intraoperative perforation closure. Success rates vary, ranging from 30% to 100%.^{1,3-5}

Composite grafts composed of polydioxanone (PDS) plates enveloped in temporoparietal fascia (TPF) provide structural support to close cartilaginous defects by promoting secondary intention healing, eliminating the need for intraoperative perforation closure.³ Previous studies have reported high success rates with this technique (86–100%),^{1,3,6,7} even in cases with large perforations (>2 cm)⁶ and granulomatosis with polyangiitis.¹

Objective

This study report two cases of symptomatic septal perforation, detailing the management from the diagnosis to treatment, including intraoperative and postoperative photographic documentation.

Additionally, this study compared the surgical outcomes with those of similar techniques described in the literature.

Materials and methods

Informed consent was obtained from both patients, and the data were collected prospectively. Both patients underwent the same surgical procedure involving the use of a composite graft composed of a 0.25-mm PDS plate enveloped in TPF.

A Y-shaped incision was made in the supra-auricular region and extended cranially to harvest enough TPF to envelop the PDS plate. A right hemitransfixion incision was then made, and the mucoperichondrium and mucoperiosteum were elevated around

the perforation. The composite graft was positioned between the residual septum and previously elevated mucosal layers. Correct positioning was confirmed using 0° endoscopic optics. The flap was anchored to the septum with one or two 3-0 PDS sutures. No attempts were made to close the perforation via mucosal flap rotation or advancement.

Bilateral Silastic® splints were then placed, and patients were instructed to perform nasal irrigation at least twice daily. The patients were also prescribed amoxicillin (875 mg) and clavulanic acid (125 mg) for 8 days. The splints were removed at 4 and 7 weeks postoperatively.

Both patients were followed up for a minimum of 1 year after the procedure.

Results

Case 1:

A 67-year-old woman presented to the otorhinolaryngology clinic complaining of nasal obstruction. She had a history of prior septoplasty and denied smoking, vasoconstrictor use, or recreational drug use. On physical examination, a 30 mm × 15 mm anterior septal perforation was observed.

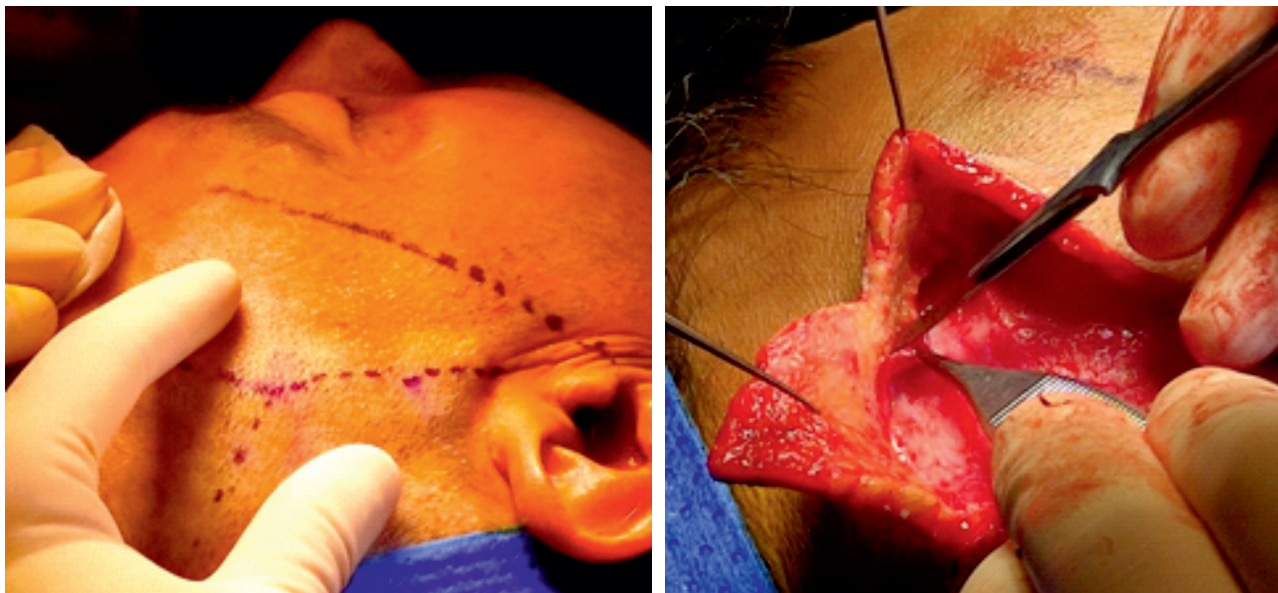
Case 2:

A 49-year-old man presented with cacosmia and nasal obstruction, accompanied by frequent nasal crusting and occasional self-limiting episodes of epistaxis. He reported no history of nasal trauma or previous nasal surgery and denied smoking, vasoconstrictor use, or recreational drug use. Objective examination revealed a 14 mm × 20 mm anterior septal perforation surrounded by crusting.

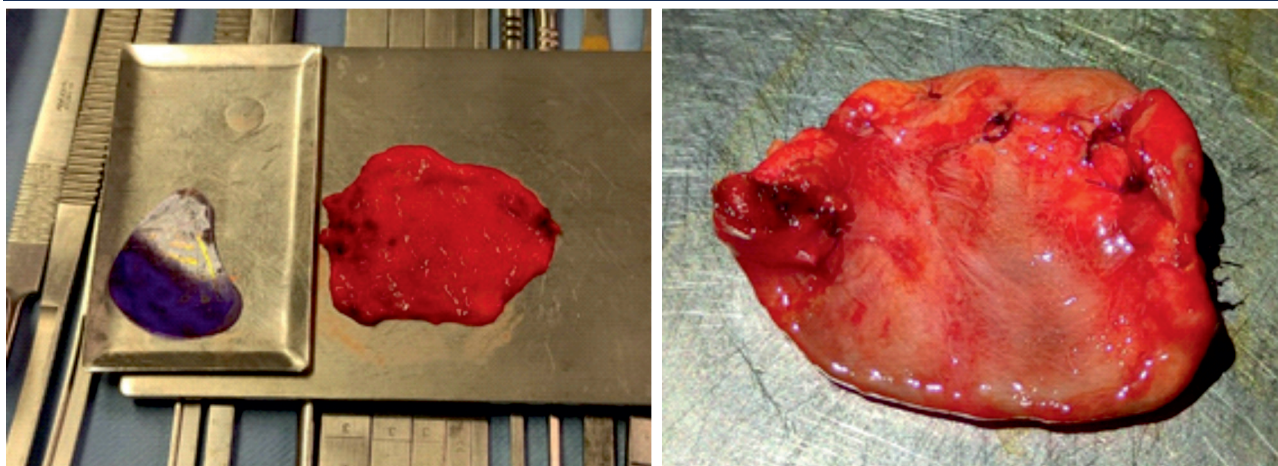
In both cases, symptoms persisted despite conservative management with enhanced nasal hydration and topical emollients; thus, surgical intervention was proposed. The procedure was performed as described in the methods section.

Both patients were followed up postoperatively for up to 1 year and achieved complete perforation closure by 6 months. The success

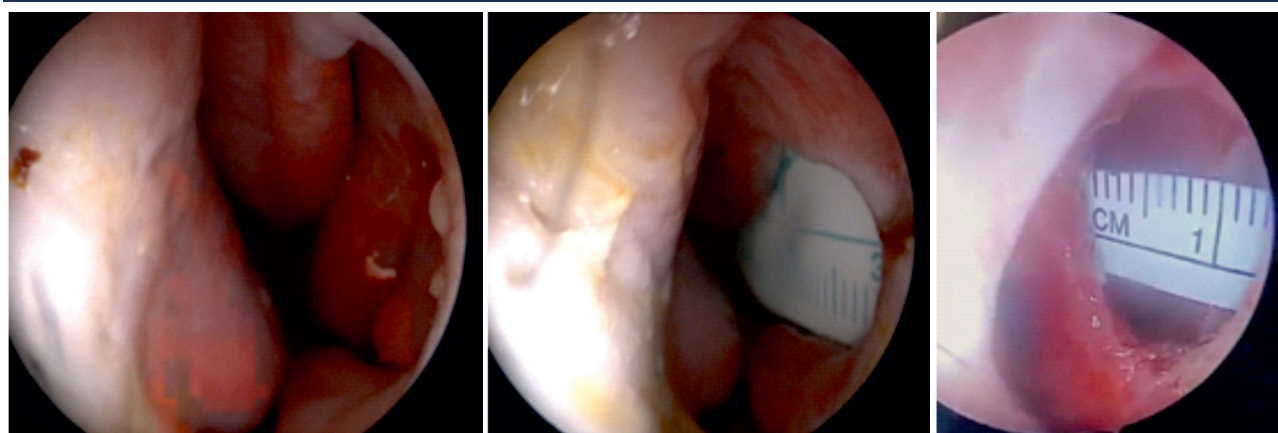
Figures 1 and 2
Demarcation of the surgical incision for temporoparietal fascia harvesting



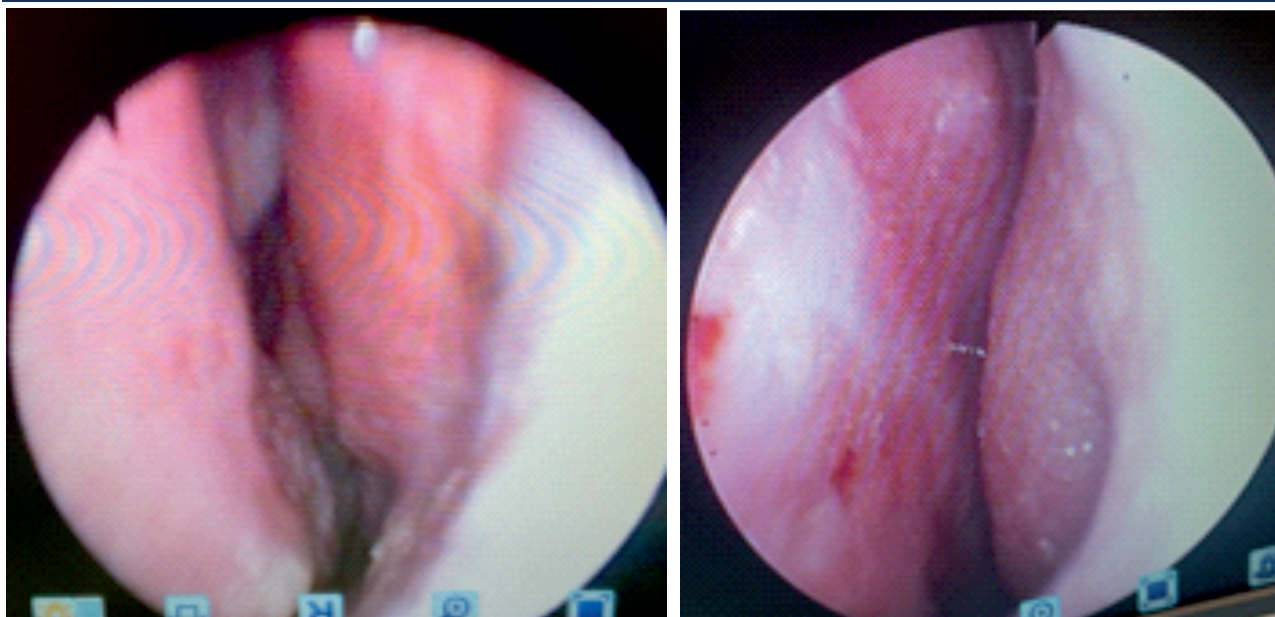
Figures 3 and 4
Polydioxanone (PDS) plate and temporoparietal fascia (TPF); composite PDS + TPF graft.



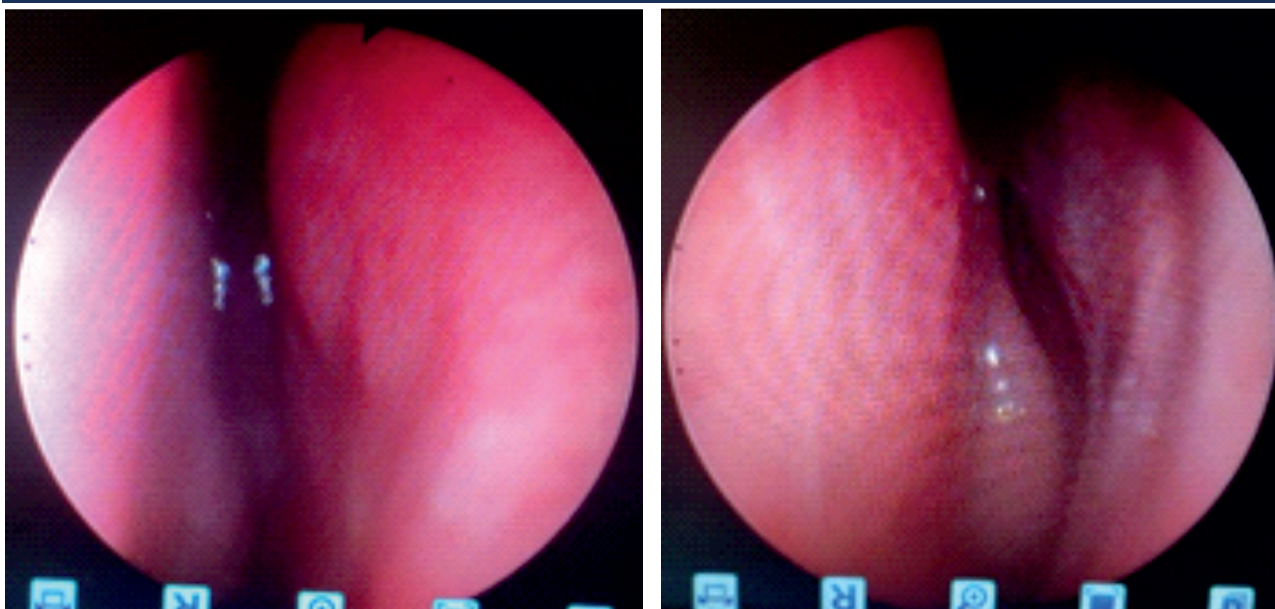
Figures 5, 6 and 7
Intraoperative view of the septal perforation. Right nasal cavity view and dimensions. Figures 5 and 6. Patient 1; Figure 7. Patient 2.



Figures 8 and 9
Patient 1. Right and left nasal cavities 1 year after the surgery.



Figures 10 and 11
Patient 2. Right and left nasal cavities 1 year after the surgery



rate was 100%. A review of the literature describing the use of composite PDS + TPF grafts was also conducted, and the findings are summarized in Table 1.

Discussion

The composite PDS + TPF graft has a high success rate, which was confirmed in the two cases presented and the reviewed literature.

A retention period of 4–7 weeks appears to be sufficient for the Silastic® splint, even for larger perforations. When possible, based on the perforation size and surgeon experience, a closed approach using a hemitransfixion incision should be considered. This technique is associated with minimal visible scarring and lower morbidity,⁴ without affecting closure success rates.^{7,13}

Table 1

Summary of the surgical approaches, complications, duration of Silastic® splint use, and success rates for septal perforation closure

Article	No. of patients	Surgical approach	Complications	Silastic® (weeks)	Follow-up (average)	Success rate
Morse, J, et al ¹	17	Open, Interposed PDS + TPF flap	1 scalp seroma	5 - 6 weeks	6 months	100%
Flavil, E, et al ³	8	Open, Interposed PDS + TPF/ deep temporal fascia flap	1 extended Unilateral Silastic® splint use	12 -15 weeks	10 months	100%
Epprecht, L, et al ⁶	7	Open, Interposed PDS + TPF flap	Perforation (40 mm × 30 mm) not closed	4 – 8 weeks	8,7 months	85,7%
Epprecht, L, et al ⁶	13	Closed, Interposed PDS + TPF flap	1 Postoperative infection	4 – 8 weeks	8,7 months	92,3%
Sand, JP, et al ⁷	7	Open, PDS + mucoperichondrium rotation flap	1 Postoperative infection	6 - 8 weeks	6,6 months	85,7%

Abbreviations: PDS, polydioxanone; TPF, temporoparietal fascia

Notably, the two clinical cases had large septal perforations, which have been associated with lower surgical success rates due to a higher risk of postoperative recurrence in previous studies.^{2,13}

This study has some limitations, including the small sample size and lack of comparison with alternative surgical techniques.

Conclusion

Surgical intervention should be considered for symptomatic septal perforations unresponsive to clinical management. Currently, there is no gold-standard protocol or technique for repair.^{4,9} However, the use of composite PDS + TPF grafts has demonstrated excellent outcomes.^{1,3,6} The successful closure of septal perforation in the two reported cases reinforces the efficacy of this approach, and it should be considered as a reliable option for the treatment of symptomatic septal perforations.

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

Data Confidentiality

The authors declare having followed the protocols used at their working center regarding patient data publication.

Protection of humans and animals

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and the 2013 Helsinki Declaration of The World Medical Association.

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Availability of scientific data

There are no datasets available, or publicity related to this work.

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