Novel Use of Unilateral Galeopericranial Flaps for Closure of Sino-Orbital Cutaneous Fistulas

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ABSTRACT

Sino-orbital cutaneous fistulas are a well-documented complication of orbital exenteration and sinonasal carcinoma resection. However, these defects remain a difficult to close due to persistent mucopurulent drainage and previous irradiation. We describe a novel approach for closure of sino-orbital cutaneous fistulas in 2 patients using a galeopericranial flap. The galeopericranial flap is ideal due to its thin, pliable nature and predictable, abundant vascularity. The flap has been used successfully in a variety of skull base and ophthalmologic surgeries. Additionally, the galeopericranial flap obviates the need for a more cosmetically disfiguring closure. Both patients' defects have remained closed at follow-up with excellent cosmetic results.

INTRODUCTION

Resections of tumors involving the sino-orbital junction are difficult due to the surrounding critical structures. Post-operative care of these surgical repairs includes chronic, non-healing sino-orbital cutaneous fistulas. These fistulas present with malodorous discharge, crusting, wound breakdown, difficulty with nose blowing, hypernasal speech, and inability to wear exenteration prostheses. In cancer operations requiring orbital exenterations, fistulas have ranged from 5.4% to 23%.6,14 Due to persistent mucopurulent drainage, infection and irradiated tissue, sino-orbital fistulas remain difficult to repair.

Operations for sino-orbital fistula closure vary depending on the size of the defect. Primary closure and secondary intention are usually inadequate due to the large size of the defect.4-13,15-16 The traditional method of repair has been advancement cheek flaps.4-13,15-16 The common theme among these articles is that a two-layered closure is required.

RESULTS

The unilateral galeopericranial flap was used to close two patients with persistent sino-orbital cutaneous fistulas. The first patient underwent a total maxillectomy, orbital exenteration and post-operative radiation therapy for invasive sinonasal melanoma. The reconstruction was done with hardware, which became infected and exposed postoperatively. An attempt was made to remove the hardware and close the defect primarily. The patient’s sino-orbital cutaneous fistula recurred and persisted due to mucopurulent drainage. The patient then underwent the galeopericranial flap procedure and the defect has remained closed at nine-month follow up.

SURGICAL TECHNIQUE

Surgical technique

Both cases began with elevation of cheek flaps on the side of the defect. These are advanced superiorly and medially to lower the tension on the final closure and decrease the size of the defect. Along with advanced lateral nasal skin, the cheek flap is also used to close the skin defect. A bicoronal incision is then carried to the subperiosteal layer. Once the proper layer has been established, the dissection is carried down to the orbit rim. The supraorbital and supratrochlear arteries may be freed from their foramina using a 2mm osteome. A tunnel is then created around the dorsum of the nose and the lateral nasal skin is undermined to assist in skin closure. The periorbital, anterior galeopericranial is then created based on the unilateral supratrochlear and supraboral vessels. Since both layers are being utilized, the dissection can be carried down to the level of the vessels without concern for vascular compromise. After meticulous hemostasis, the flap is tunneled through the bridge of skin and sutured into the defect creating the inner lining. The undermined, advanced skin is the closed providing a three-layered closure. The bicoronal incision is closed in a standard fashion with a closed-suction drain.

CONCLUSIONS

Sino-orbital cutaneous fistulas remain a common problem in sino-nasal tumor resections and orbital exenterations. Due to persistent mucopurulent drainage and poorly vascularized tissue in the irradiated area, the repair options are limited and difficult. We present the novel use of the galeopericranial flap for definitive closure of sino-orbital cutaneous defects. The flap is thin, versatile, highly vascular, and easy to harvest with low morbidity and a cosmetically pleasing result.

REFERENCES


Figure 3 – Sino-orbitalcutaneous fistula in patient 2

Figure 4 – Galeopericranial flap raised

Figure 5 – Flap tunneled under nasal dorsum and overlying defect

Figure 6 – Flap placed under cheek flap

Figure 7 – Immediately post-op

Figure 8 – Four month postoperative result

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