

Case Report

Closure of sino-orbital fistula using glabellar rotation flap: A case report

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Abstract

Background: Sino-orbital fistulas (SOF) are a well-reported complication of orbital exenteration and sinonasal carcinoma resection. Despite repair, however, complete fistula closure may be difficult.

Case: A 79 –years-old man had undergone total exenteration of right orbit for spreading squamous cell carcinoma of conjunctiva. Subsequently he developed two large sino-orbital fistulae medially to the ethmoid sinus wall of the orbit. Post- operatively good socket hygiene was maintained but the fistulae increased in size. At 3 month follow up, closure of the fistulae using glabellar rotation advancement flap was done. The defects have remained closed at follow-up with excellent cosmetic results. There is no recurrence of fistula or malignancy till date. Patient was cosmetically rehabilitated with spectacle prosthesis.

Conclusion: Glabellar rotation flap for closure of medially situated sino- orbital fistulae is a good option with excellent cosmetic result.

Key words: Exenteration, sino-orbital fistula, glabellar rotation flap

Introduction

Orbital exenteration is a psychologically and anatomically disfiguring procedure reserved for treating potentially life threatening malignancies or progressive conditions unresponsive to other treatments. Various techniques of exenteration (Sheilds et al, 1991), retention of conjunctiva (Frezotti et al, 1982), and preservation of the periorbita (Shore et al, 1986) are methods that have been introduced

as modifications of exenteration to aid in facial rehabilitation.

Sino-orbital fistulae are uncommon but not rare complications of orbital exenteration. Risk factors that may contribute to fistula formation include radiotherapy, sinus disease, intraoperative penetration into a sinus and immunocompromised state. Fistulae have been found to develop more commonly with sockets left to granulate (80%) than with the use of skin grafts (Rahman et al, 2005). Management is usually tailored to the individual case and ranges from conservative socket hygiene to surgical repair with grafts or flaps. We hereby describe a technique of closing sino-orbital fistulae using glabellar rotational advancement flap along with review of literature.

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Case Report

A 79- years- male had undergone total exenteration of right orbit for a histopathological proven moderately differentiated spreading squamous cell carcinoma of the conjunctiva. At 3 week follow up, two serous discharging sino-orbital fistulae were found medially to the ethmoid sinus. Conservative management was continued, but the fistulae gradually increased in size to 5 mm x 5 mm (Fig 1). At 3rd month follow up, we planned for closure of the fistulae. A single layer closure of the sino-orbital fistulae using glabellar rotation flap was done under general anaesthesia (Fig 2a,b,c,d). Patient was discharged with instruction for dressing with antibiotic ointment and regular follow-up (Fig 3). No recurrence of fistula or

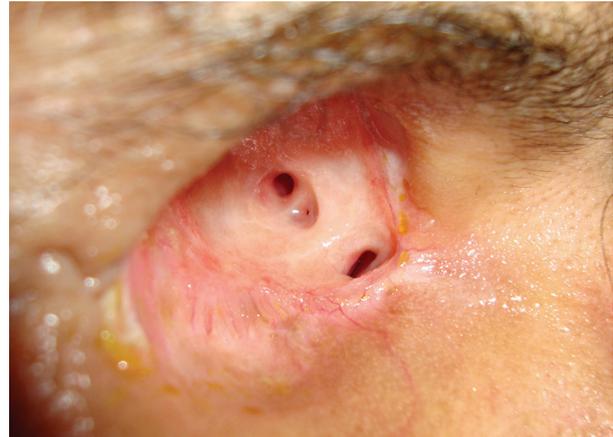


Figure 1: Sino- orbital fistulae at 3 weeks follow up after total exenteration

malignancy has been noted till last five years. Patient was rehabilitated cosmetically with spectacle prosthesis (Fig 4).

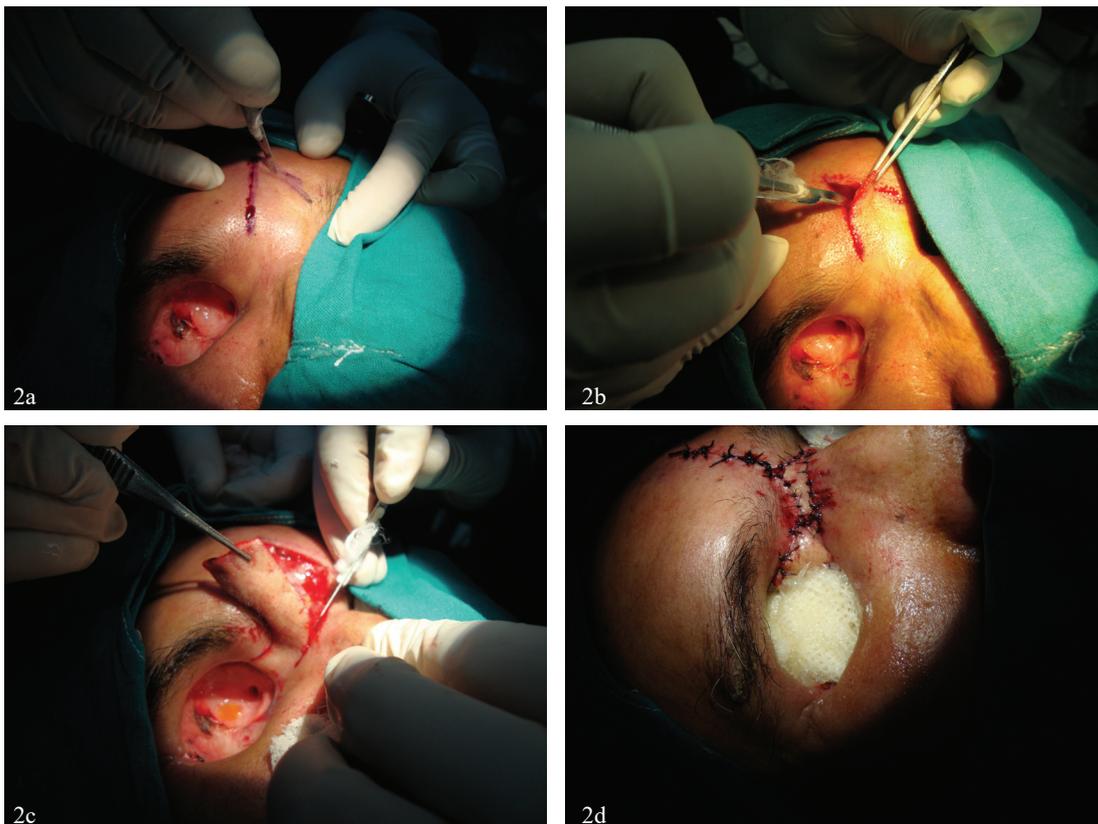


Figure 2.a,b,c,d: Surgical steps showing construction of glabellar rotation flap



Figure 3: Closed fistulae at 3 month follow up



Figure 4: Cosmetic rehabilitation by spectacle prosthesis

Discussion

Challenges to successful closure of sino-orbital fistulae are their complex anatomy, communication with sinonasal mucosa, persistent mucopurulent drainage, post irradiation poor wound healing, and wound infection (Tse et al, 1989). Limawararut V et al (2007) reported a retrospective study results, in which out of 140 exenterations, 5 patients developed sino-orbital fistula. The majority (5/6) of fistulae occurred medially to the ethmoid sinus, 1 of whom developed 2 fistulas at separate site and 1 was superiorly related to the frontal sinus. Four of the 6 fistulae recurred after repair, 3 of these subsequently were closed successfully. Only 1 fistula remained till the death of the patient. Risk factors found in this study include radiotherapy (3/6), sinus disease (3/6), intraoperative injury to the sinus wall (3/6) and immunocompromise (1/6).

In another study, by Rahman I et al (2005), commonest complication of exenteration was found to be SOF. Out of 15 SOF, 12 patients

in whom the orbit was allowed to granulate and in only 3 patients in whom a split skin graft was placed. It has been observed that healing of the orbital defect is dependent on the method used for reconstruction. Various options include temporalis muscle transposition(Reese et al, 1961), midline forehead flaps(Dortzbach et al, 1981), dermal graft (Mauriello et al, 1985),dermis fat graft (Shore et al, 1986), split skin graft (Harting et al, 1985), globe sparing exenteration (Catalano et al, 2001), eyelid sparing techniques (Sheilds et al, 1991) and spontaneous granulation (Putterman et al, 1986).

Allowing granulation of the defect may delay healing by up to 2–3 months. Healing by secondary intention has several potential benefits namely, an easier, faster procedure for early detection of recurrence as well as providing a comparable colour match to the surrounding skin when granulation is complete (Bartley et al, 1989). However, as seen in the above study, significant numbers of patients may develop sino-orbital fistulas from perforated sinuses occurring intraoperatively, when left to granulate. Other disadvantages of secondary healing of an exenterated orbit are delayed healing and facial rehabilitation and prolongation of postoperative socket care(Rahman et al, 2005).

In our case, the aetiology of SOF was most likely an intraoperative penetration into the ethmoidal sinus, which failed to heal by granulation alone.

The glabellar flap was first described by McCord and Wesley, it involves an inverted V incision in the median forehead area between the eyebrows. The angle of the V should be between 45°-60°, since a larger angle makes a cosmetically poor bulky flap on the root of the nose, while a narrow angle compromises blood supply. The apex of the V is shifted from the midline towards the side of the defect (McCord CD et al,1987). In our case, we excised the apex of the V partly, as it was not serving any purpose.

The advantages of the glabellar flap are, that it is a relatively quick procedure, with a good vascular supply and can also cover deep defects as it is a thick flap. The disadvantages are, it results in a bulky nasal bridge and draws the eyebrows together. Scar contracture may cause webbing. It may also result in prominent scars that cross the relaxed skin tension lines of the forehead. This flap is best used for small defects above the medial canthal tendon as in lower or larger defects, there is considerable tension at the nose at the site of flap rotation (Sharma et al, 2006).

Tse et al (1985) described a novel approach for closure of sino-orbital cutaneous fistulas using a galeopericranial flap. For large fistulae, two-layer closure using such tension-free local flaps may be done. It is ideal due to its thin, pliable nature and abundant vascularity. Additionally, it avoids the need for a more cosmetically disfiguring closure. However, the galeopericranial flap has not been much described.

Conclusion

Successful closure of sino-orbital fistula (medially located) can be done with glabellar rotation flap. Patient counselling is very important in such cases as the long term follow up and dressing of the wound is essential for wound healing. Cosmetic reconstruction is a major dilemma in exenterated patients. Spectacle prosthesis may be considered for rehabilitation in older patients.

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