Case Report

Management of parotid fistula using hypertonic saline

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ABSTRACT

Parotid fistula is a very rare, unpleasant and painful complication following surgery in the maxillofacial region. Although there is consensus in the literature that acute parotid injury must be explored primarily and all injured structures be repaired accurately, the treatment of the chronic injury is controversial. Numerous methods of treatment, conservative as well as aggressive, have been described with varying success and morbidity. This paper presents a simple but effective and conservative method of treating this complication with the use of hot hypertonic saline.

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Introduction

A parotid fistula is a rare and extremely unpleasant complication following surgery in the maxillofacial region. Parotid fistulae have been reported following surgery in the temporomandibular joint (TMJ) region, parotidectomy or secondary to drainage of facial/parotid abscess, and the incidence reported is as high as 14%. Other causes of parotid fistulae include mandibular osteotomy,[1-3] use of external pin fixation[4] and as a complication of facial fractures.[5]

Although there is consensus in the literature that acute parotid injury must be explored primarily and all injured structures be repaired accurately, the treatment of the chronic injury is controversial. Numerous methods of treatment, conservative as well as aggressive, have been described with varying success and morbidity.

Management options include pressure dressings and use of antisialagogues,[6] total parotidectomy, tympanic neurectomy,[7] intraoral transposition of parotid duct,[8] radiation therapy,[9] use of botulinum toxin A,[10-12] and use of fibrin glue.[13]

In this paper we describe a simple but effective method of treating this complication with the use of hot hypertonic saline.

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Case Reports

Case 1

A 38-year-old man reported to the department of oral and maxillofacial surgery with a history of fall. He was diagnosed with left subcondylar, left angle and right parasymphysis fractures. He was thoroughly investigated and open reduction and internal fixation was done under general anesthesia.

A mini-retromandibular approach was used for the fixation of the subcondylar and angle fracture, while parasymphysis fracture was reduced intraorally. On the seventh postoperative day, a diffuse swelling was observed in the left parotid region and on compressing the swelling; a watery, odorless discharge was seen from the sutured surgical wound [Figure 1].

A diagnosis of parotid fistula was made on the basis of history, location of swelling and clinical inspection of the discharge. The pressure dressing was applied for first four days after the aspiration along with

Figure 1: Lateral view of parotid fistula swelling (a), Frontal view of the parotid fistula swelling (b), Frontal view of the parotid fistula swelling (c), Collection from the parotid fistula swelling (d), Disappearance of the swelling 12 days after hypertonic saline therapy (e)

antisialagogues and antibiotics. There was no significant decrease in the size of swelling or discharge.

Afterwards we decided to use hot hypertonic saline injections. A 3% hypertonic saline was poured in a clean steel bowl and was heated to a temperature of 60 degree in an autoclave previously set at the required temperature. The mentioned site was prepared by scrubbing with Betadine solution. Five milliliter of this hypertonic solution was injected into the parotid through fistulous opening, followed by pressure dressing. The patient was instructed to continue same medicines. This procedure was repeated for three days. On the fourth day the patient did not show any signs of swelling or salivary leak as the fistula closed spontaneously.

Pressure dressings and use of antisialagogues cause fibrosis of the gland in 2 to 3 weeks;[6] hence closure of fistula in 4 days was attributed to warm hypertonic saline injections. Follow-up was done for 5 months with no morbidity seen. The facial nerve and its branches were evaluated and were found to be normal.

Case 2

A 27-year-old male was treated with ORIF for right subcondylar fracture via retromandibular approach. Again discharge of colorless, odorless watery fluid from right parotid region was noticed after second postoperative day, Diagnosis of parotid fistula was made and treated with hypertonic saline injections.

Table 1: Management of parotid sialoceles and fistulae - A classification of reported methods in the literature (Parekh *et al* 1989)

Diversion of parotid secretion into the mouth
Reconstructive methods
Delayed primary repair of duct
Reconstruction of duct with vein graft
Mucosal flaps
Suture of proximal duct to buccal mucosa
Formation of a controlled internal fistula
T-tube or catheter drainage into the mouth
Drainage of proximal duct by a catheter
Parotidectomy
Local therapy to the fistula
Excision
Cauterization
Depression of parotid secretion
Surgical approaches
Duct ligation
Sectioning of the auricotemporal or Jacobsen's nerve
Conservative approaches
Administering nothing orally to the patient until the fistula closes
Drugs: atropine or pro-banthine
Radiotherapy
Repeated aspiration and pressure dressing

Warm hypertonic saline (60°C) was injected after flushing with Betadine followed by pressure dressing and antisialagogue drugs were given for 5 days. On the fifth day of this course the fistulous tract healed spontaneously and there were no associated complications. Patient is on continuous follow-up since 3 months and there are no complications reported till date [Figure 2].

Case 3

A 20-year-old patient who was treated for subcondylar fracture via retromandibular approach reported to the

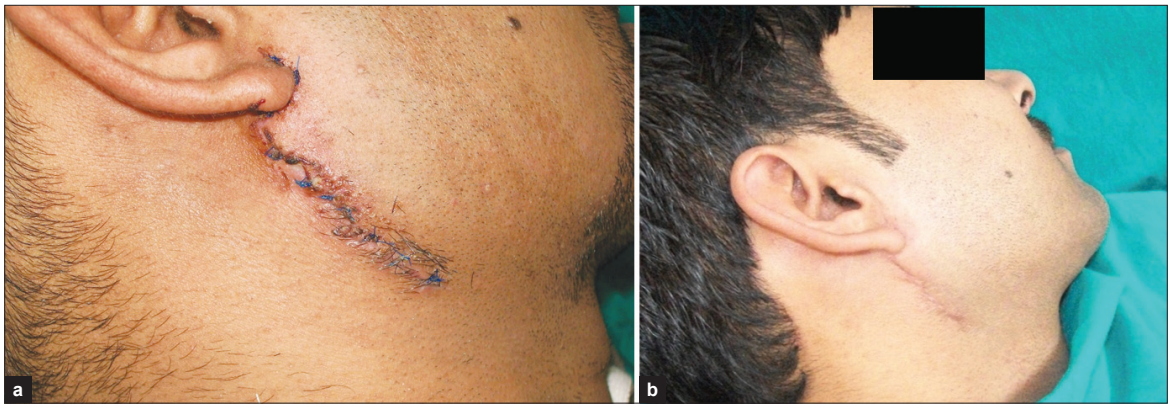

Figure 2: One week post op parotid fistula (a), four week postoperative picture with complete healing (b)

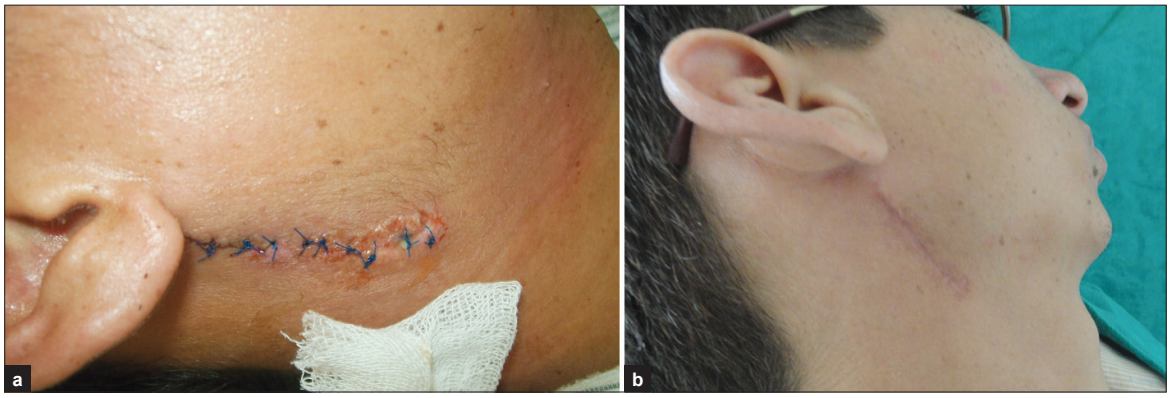

Figure 3: Fifth day postop with the draining fistula (a), 8 weeks postoperative picture with complete healing (b)

department with chief complaint of watery discharge in preauricular region, which increased while having food. It was diagnosed with parotid fistula on right side. The same treatment protocol of using hypertonic saline was followed.

Hypertonic saline was injected everyday for four days, after flushing with Betadine, pressure dressing was applied. On the fifth day the fistula healed completely with no complaints [Figure 3].

Discussion

The management of parotid fistulae and sialocele has been controversial. The surgical techniques can be classified as those that divert parotid secretions into the mouth and those that depress parotid secretion either by ductal ligation or nerve sectioning. Conservative approaches include attempts to depress secretion by antisialagogues or radiotherapy [Table 1].[6]

The major problem with techniques attempting to divert secretions into mouth with reconstructive surgery has been the difficulty in identifying the proximal duct in the extensive scarring that forms around the fistula with its associated significant risk of damage to the facial nerve.[14] Parotidectomy has also been discouraged as a treatment modality as postoperative facial palsy is seen in 75% of cases.[14]

Low-dose radiotherapy for the treatment of parotid fistula is validated because parotid secretions are reduced after radiotherapy but because of its long-term ill effects it is not the preferred method of treatment.

Tympanic neurectomy appears to be a satisfactory method of dealing with selected parotid duct fistulas, and glandular fistulas are best treated by tympanic neurectomy. Suppression of parasympathetic activity by the use of tympanic neurectomy has been said on some occasions to be transient (for example, Frey's syndrome).[7]

Pressure dressings lead to atrophy of the gland as the lobules of the gland are contained in relatively inelastic capsule. The sustained rise in ductal pressure leads to compression of capillaries and veins, resulting in decrease in secretion and atrophy of gland.[6] But there is no adequate proof of their efficacy in literature.

Absence of reflex stimulation from mastication and chemical stimuli minimizes parotid secretions and allows healing of injured duct, but this method requires

maximum patient compliance for prolonged time. Anticholinergic drugs are unlikely to be useful if used alone and are associated with numerous side effects like urinary retention, xerostomia, nausea, vomiting, vision disturbances etc.

Botulinum toxin A has been used nowadays but it has a latency period and requires repeated injections for desired effects and the effects may not last long enough to bring about complete remission of disease. Moreover it is a costly procedure.

Fibrin glue has also been used recently;[13] however, it is said that fibrin glue is rendered inactive by saliva leading to recurrence of fistula.

Hypertonic saline has been used in sclerotherapy in various concentrations. It has also been used for the treatment of varicose veins as an alternative to surgery;[15] and in the head and neck region for treatment of venous malformations with good results.[16] Thermodynamic and physicochemical calculations suggest that these solutions work by causing conformational denaturation of the cell membrane proteins *in situ* and saline can be diluted to a point where there will be no cellular toxicity. The temperature of the saline can be raised above body temperature (60 degree) to enhance the fibrosing property of physiologic saline.[17]

Conclusion

Hot hypertonic saline can be used for the purpose of fistula closure because it is cost effective, causes no foreign body reaction or hypersensitivity reaction to the patients, easily available, non-toxic and non-irritant to the surrounding structures. There are no chances of inadvertent injury to facial nerve and its branches and serves the purpose of causing fibrosis of gland parenchyma and spontaneous closure of fistula with no complications.

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