Case Report

Secondary Repair of Parotid Duct Injury: A Case Report and Review of Literature

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ABSTRACT

Injury to face with involvement of parotid duct is a common occurrence in maxillofacial traumatic injuries. Common causes include sharp penetrating wounds in the oral cavity or in the face, road traffic accidents, malignancies and operative complications. Various management strategies can be followed in management of injured Stenson's duct according to site of injury but primary anastomosis of the injured duct in such cases should always the first priority. Here, we present a case of sharp injury to the face with sectioning of right parotid duct that later developed a fistulous tract and was secondarily managed by anastomosing the injured duct.

Keywords: Duct anastomosis; facial injuries; Stenson's duct; parotid fistula.

INTRODUCTION

A parotid fistula is a communication between the skin and a parotid duct or gland through which saliva is discharged.[1] Traumatic causes include sharp penetrating wounds in the oral cavity or in the face, followed by malignancy, operative complication (parotidectomy or rhytidectomy), blunt trauma such as zygomatic fractures and mandibular fractures. Extrinsic infections from mandibular teeth, mumps, actinomycosis, tuberculosis and syphilis have been recognized as causes of parotid fistula in the past. Here, we present a case of young male with parotid fistula resulting from an assault with a sharp weapon. We have also discussed the various treatment options available for the management of parotid fistula considering the level of injury.

CASE REPORT

A 19-year-old male was assaulted with a knife causing a deep facial laceration. He was taken to a general hospital where primary wound management was done with debridement and skin suturing. On the 9th day patient developed a diffuse swelling on the right parotid region and discharge of watery fluid from the wound margin. There was no episode of fever and his medical history was not contributory. There was no associated pain or alteration of facial function as well as no motor or sensory deficits were observed.

On examination, there was an irregular scar of about 7 cm from right ear lobe to the ala of nose (Figure 1). A diffuse swelling of 2 cm X 3 cm was present near the right ear lobe. On palpation it was soft, non-tender and on compression, clear watery fluid was seen discharging from the sutured margin. Intraorally, there was no discharge from the right parotid duct opening. The left parotid duct outflow was normal. Oral mucosa and teeth showed no abnormalities. The clinical diagnosis confirmed a parotid fistula of right side and patient was successfully managed by surgical repairing of parotid duct.

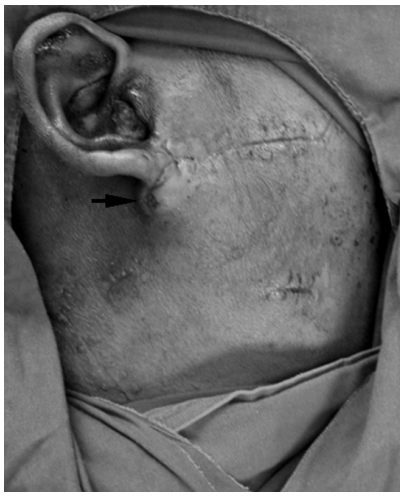

Figure 1: Diffuse swelling on the right parotid region and discharge of watery fluid from the wound margin (arrow hints the orificium fistulae).

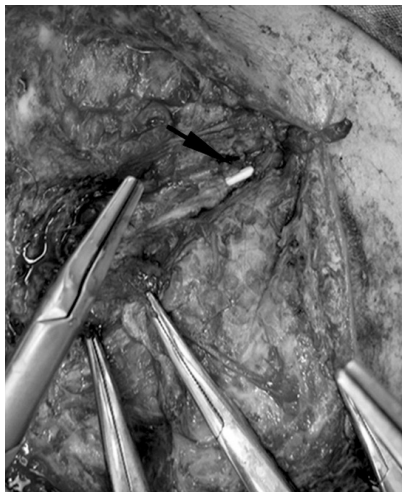

Figure 2: The severed parotid duct was located (arrow hints a stent).

The procedure was performed under general anesthesia with local infiltration of 1:100000 adrenaline around the incision line to minimize intra-operative bleeding. A Modified-Blair incision was given to expose the parotid gland and its duct. The fistulous tract was traced along with the severed parotid duct. The proximal and the distal stump were identified at the level of the masseter muscle. A stent was passed through the distal stump and was received from the parotid duct papilla. The stent was then introduced into the proximal stump. The proximal stump was identified by gently pressing the parotid gland and observing the extrusion of fluid from the duct. The duct anastomosis was carried out over the stent with 9-0 interrupted nylon suture. The fistulous tract was excised. The parotid fascia was approximated and sutured with 3-0 Vicryl and the wound was closed in layers. The intraoral portion of the stent was trimmed and approximated with silk sutures to the buccal mucosa. Following surgery, there was no facial nerve deficit. Post-operatively, patient was placed on antibiotics and a pressure bandage was given. On the 8th day the skin suture was removed. No swelling was present at that time. On the 14th day the stent was pulled and salivary outflow through the papilla was observed.

DISCUSSION

The parotid duct or the Stenson's duct arises from the anterolateral portion of the gland and passes superficially over the masseter, turns medially at the anterior border of the muscle and pierces buccinators to open into the papilla against the 2nd upper molar tooth. The course of the duct can be marked by joining the ipsilateral tragus and the midpoint of upper lip. Any injury crossing this imaginary line raises the suspicion of parotid duct injury. The most susceptible site for injury in penetrating trauma is when the duct passes superficially the masseter muscle.[2]

All facial lacerations should be carefully evaluated for injury to Stenson's duct, the parotid gland, branches of facial nerve and the transverse facial artery. It is important to identify the ductal injury so that early repair is possible which may prevent the future complications such as sialocele and salivary fistula.[3] Detection of injuries require either routine sialograms, careful exploration of all wounds in the region of the parotid duct,[4] cannulation of the duct and wound exploration for a protruding cannula[5] or cannulation and injection of methylene blue into the duct.[6]

Van Sickels and Alexender (1981) classified parotid duct injuries into three types based on its anatomic location in relation to the masseter muscle (Figure 2). Type A injuries occur proximal to the posterior border of the masseter: Type B involves injuries of the duct lying superficial to the masseter muscle: Type C injuries occur distal to the anterior border of the muscle.

The management of the ductal or glandular injury depends upon the site of injury as follows:

Type A or intra-glandular ductal injuries are generally effectively treated with capsular suturing and pressure dressing.

Type B injuries are treated by suturing the duct over a catheter which is subsequently removed. If the extent of injury is severe enough to preclude this approach then the proximal ductal segment is ligated.

Type C injury treatment involves establishing a connection between the duct and the oral cavity by means of an intra oral fistula.

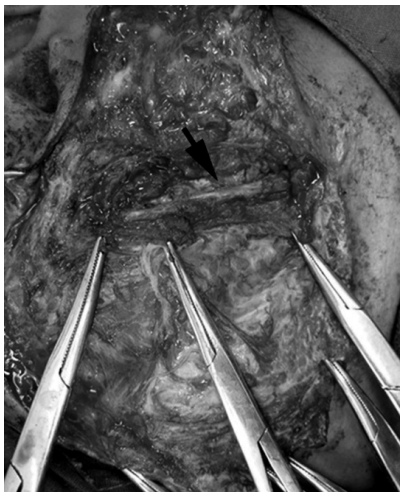

Figure 3: Ductal anastomosis carried out over the stent with interrupted 9-0 nylon suture.

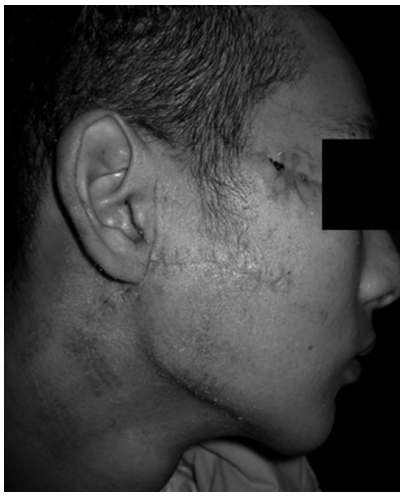

Figure 4. On the 14th day after surgery, the diffuse swelling and orificium fistulae disappeared.

Both surgical and non-surgical approaches are accepted as modalities of treatment for Parotid gland and Duct system injuries.

Nicoladoni first reported primary anastomosis of the parotid duct following injury in 1896. Morestin reported ligation of the proximal stump in 1917. Experience in treating parotid duct injuries increased with the outbreak of World War I. Primary microsurgical repair whenever possible is the treatment of choice, but primary repair is practical only if the injury to the duct involves minimal tissue loss.[7,8] Primary anastomosis is suitable for site B injuries that involves sharp lacerations of the duct with minimal or no tissue loss. After locating the distal and the proximal parts of the duct, the stumps are dissected free of surrounding tissue to provide for a tension free coaptation taking care of the buccal branch of the facial nerve and the transverse facial artery that lies in the close proximity of the duct. The stent prevents the stenosis in the area of duct repair and it is removed after 10-14 days.[9] For cases involving more significant tissue loss, a vein micrograft can be used for reconstruction of the parotid gland.[10] Proximal duct ligation is performed in more severe tissue loss where none of the above mentioned procedure is possible. Proximal duct ligation leads to glandular atrophy and closure of fistula but carries the risk of chronic painful parotitis.[2,11] However it leads to painful accumulation of saliva (sialocele) which requires repeated needle aspiration and compressive dressing.[12]

Sectioning of the auriculotemporal nerve or Jacobsen's nerve[13,14] is less aggressive treatment of chronic salivary fistulas. This technique involves the surgical disruption of the anterior and posterior fibers of the tympanic nerve by drilling into the temporal bone at the hypotympanium. This produces glandular atrophy over a period of time. This procedure is not predictable and is discouraged by several authors.[15]

Another alternative for large parotid duct injuries is the creation of a fistula from the proximal portion of the injured duct to mouth.[12] More aggressive approaches include superficial or total parotidectomy.[4]

Pressure dressing causes compression of the gland leading to compression of capillaries and veins resulting in diminution of secretion and gradual atrophy of the gland. With compression, the parotid duct will slowly undergo fibrosis essentially ligating itself over a period of week to month.[2] Its disadvantage is repeated aspiration and elimination of oral intake by the patient for which patient requires hospitalization and IV fluids or parenteral nutrition.

The administration of anti-sialagogues, anticholinergic medications that inhibit the neural stimulations of the parotid gland also reduces secretions. Their major disadvantage is that patients may experience a variety of unpleasant anticholinergic side effects including xerostomia, dry eyes, blurry vision, constipation and urinary retention.[16]

Intraparotid injections of Botulinum toxin (BTx-A) is another means of reducing parotid gland secretion.[17,18] Botulinum toxin is effective because it blocks the presynaptic release of acetylcholine, which the parotid gland depends upon for its neural stimulation. It has a latency period and requires repeated injections for desired effect and the treatment is less cost effective.

Fibrin glue has been used in recent years to seal the fistula.[12] It has been advocated that fibrin glue is rendered inactive by saliva leading to recurrence of the fistulous tract.

Radiation therapy in low doses is intended to reduce glandular fibrosis and cessation of the salivary

production.[6] Approximately 1800 rads are required to produce glandular atrophy. However its well recognized side effects and less effective for ductal injuries, is not the preferred treatment modality.[11]

Recently use of hypertonic saline in the management of parotid fistula and sialocele has shown effective results.[10] Hypertonic solution works by causing fibrosis of gland parenchyma and spontaneous closure of the fistula with no complication. However more clinical experience and research is needed for its efficacy.

Immediate detection of parotid duct injury and primary repair offers the best possible outcome. The very fact that a variety of methods both conservative and operative have been reported in the literature, points to the absence of a reliable method to treat this distressing problem to the patient. However, whenever possible primary anastomosis of the injured duct is best option leading to normal return of function.

JNDA

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