

Case Report

A novel technique in the treatment of post traumatic parotid duct sialocele

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ABSTRACT

Stenson's duct of parotid gland is a major duct which drains saliva into the oral cavity. Deep penetrating wound in the form of cut or crush injury to the buccal area carries the risk of parotid duct injury. It is in the form of ductal exposure, laceration, total severing, or crushing of the duct. These conditions are difficult to diagnose because of complex anatomy and variable nature of injury. Successful management of parotid duct injury depends on early diagnosis and appropriate intervention, failing of which may lead to complications like sialocele or salivary fistula. Many techniques have been proposed for diagnosis and management of parotid duct injuries. This article presents an easy and an innovative technique to diagnose and manage the parotid duct injuries using an "epidural catheter" which is often used for inducing spinal anesthesia. The technique of epidural catheter usage, its advantages, and limitation over other techniques proposed for the management of parotid duct injury are discussed.

Keywords: Epidural catheter, Parotid duct, Salivary fistula, Sialocele

INTRODUCTION

Deep penetrating wounds over the buccal area are common in maxillofacial injuries. Vital structures like parotid duct, facial nerve branches, and transverse facial artery are vulnerable to injury in such situations.¹ Injuries to parotid duct include ductal exposure, laceration, total severance, and crushing. These injuries, if left untreated, lead to complications like pseudo cyst (sialocele) or salivary fistula formation.² Early diagnosis and proper management becomes crucial in preventing such complications. Immediate duct repair, ligation of proximal cut end, and fistulization of parotid duct are some of the surgical treatment modalities in practice.^{3,4} First primary anastomosis of the parotid duct was reported in 1896 by Nicoladoni.^{3,4} Since then, several techniques like use of milk, propofol, and methylene blue dye for diagnosing the duct injury, and use of vein grafts, stiff iodine catgut, fusiform bougie, urethral catheter,

vitalium wire, horse hair suture, and silk worm gut as an indwelling stent inside the parotid duct before repairing have been reported.^{5,6} Two studies have reported the use of epidural catheter as an indwelling stent for the repair of parotid duct.⁷

CASE REPORT

A 30-year-old male patient presented to our outpatient department, Dr. Shankarrao Chavan Government Medical College, Nanded, Maharashtra, India, with a chief complaint of swelling on left cheek and swelling was increasing in size while eating. Past history of trauma in the form of incised wound from a road traffic accident 2 months before at the site and was sutured by local practitioner. Clinical examination revealed a swelling of about 4×4 cm in size, non-tender, having fluctuation test positive. Overlying skin shows a healed linear scar mark which was extending from lower margin of left

lobule to upper lip (Figure 1 A and B). Investigations in the form of ultrasound and aspiration cytology were done. Ultrasound showed that there is a localized encapsulated collection and on aspiration it showed clear straw colored fluid. With these clinical findings, a diagnosis of left parotid duct sialoceles secondary to parotid duct injury due to previous trauma was done. With the suspicion of injury to regional vital structures, the patient was taken for surgical exploration by locally anesthetizing the area with anesthetic agent lignocaine 2% with adrenaline 1:200,000. An elliptical incision around previous scar was done. A thin walled cystic mass dissected all around and removed. Buccal branch of facial nerve was identified and preserved. With a suspicion of parotid duct injury, left parotid duct orifice in the buccal mucosa was located near 2nd maxillary molar and the same was cannulated with 16G epidural catheter which was easily available in the operation theater. Prior to cannulation, epidural catheter was slightly modified by cutting the closed distal tip end. Once the duct was cannulated, care was taken not to fully push the catheter in to the duct. Normal saline was slowly flushed through the catheter and the subsequent leak in the wound was carefully noted which confirmed the parotid duct injury. With proper hemostasis, all areas of the wound were checked and the exact site of saline leak (distal cut end of parotid duct) was located. Further advancement of the catheter was performed, which made it to exit in the wound from the distal cut end of the duct (Figure 2). Further, the wound was carefully explored to trace the proximal cut end of the parotid duct, identified and confirmed by flow of secretions by pressing on left parotid gland and the same was cannulated with the catheter that had exited from the distal cut end (Figure 3). At this point, we had a stent passing through both the cut ends of the duct. Microsurgical anastomosis of cut ends of the ducts was done with 6-0 Vicryl (polygalactin 910, Johnson and Johnson) suture and further wound closure was done in layers (Figure 4). The cannulated epidural catheter was left in the duct and excess length was cut 2-3 cm beyond the ductal orifice. It was fixed to the buccal mucosa by suturing. Epidural catheter was kept in this position for 3 weeks, which maintained the patency, flow, and prevented duct from getting compressed by postoperative edema. Postoperatively the patient was supported with oral antibiotics and analgesics. Oral hygiene maintenance was done with betadine 1% gargles and patient was advised to have a liquid diet. Postoperative follow-up revealed no signs of sialoceles formation with a regular flow of saliva from the catheter and the patient was discharged on 2nd postoperative day. Extra oral wound sutures were removed on 7th postoperative day. Wound healed without complication and the catheter was removed on 21th postoperative day. Flow of saliva through the duct orifice was noted immediately. Regular follow-up was done for 2 months at regular intervals.



Figure 1 (A and B): Showing swelling and linear scar just above upper lip on left cheek.



Figure 2: Showing insertion of epidural catheter in and its exit through distal cut end of parotid duct.



Figure 3: Showing epidural catheter in proximal and distal end of parotid duct.



Figure 4: Showing parotid duct repair after completion of suturing.

DISCUSSION

Deep penetrating and crushed wounds over buccal area are common in maxillofacial injuries. Injury to vital structures like parotid duct, facial nerve, and transverse facial artery are part of these. Management of parotid duct injury is unique, as any extravasations of saliva in the wound will lead to complications like pseudo capsule (sialoceles) or salivary fistula formation. Conservative management of parotid duct injuries is one amongst the various treatment modalities proposed. This believes in treating the complications like sialoceles or salivary fistula with no indication of immediate parotid duct repair.² Studies have reported that correction of these complications may require surgical or medical treatments like use of anti sialogogues, radiation therapy, parasympathetic denervation (tympanic denervation), cauterization of the fistulous tract and reconstruction of the duct, superficial or total parotidectomy.^{3,8} A significant delay in the healing of complications was noted when there was total transection of duct.⁹ Immediate microsurgical anastomosis of the parotid duct injury is one such modality of treatment, which will possibly prevent such complications. Use of methylene blue dye for retrograde filling of the duct from orifice and its subsequent leak from the injured duct in the wound is a well-documented technique for diagnosing ductal injuries as it maintains the contrast with tissues.² However, it is difficult to identify and repair the duct as all the structures are deeply stained blue and may affect the glandular tissue as well.¹⁰ Hence, use of methylene blue can only be a diagnostic procedure for duct injuries. In our technique, normal saline was flushed slowly after cannulating the duct with epidural catheter. Its subsequent leak in the wound was diagnostic of duct injury. This proved advantageous over methylene blue as it did not stain the tissues and had no effect over glandular tissue. Moreover, epidural catheter acted as an indwelling stent inside the site of duct injury, which was helpful for anastomosis. Literature report reveals use of milk and propofol for the diagnosis of parotid duct injuries by the same technique.⁵ But their limited studies put them into a remote practice. Use of sialography for diagnosing parotid duct injuries has been documented with the use of contrast media.^{9,11} Need for extra time, special equipment like X-ray unit, radiation exposure of the patient, and radio opaque dye are the factors to be considered for this technique. Effect of contrast media on glandular tissue and its reactivity cannot be neglected as well. Water-soluble contrast media have a definite advantage over lipid-soluble contrast media in clearing from the site after usage.³ The present technique did not use any such material which could alter the parenchyma of gland or cause allergy. Flexibility and soft consistency of the duct make it difficult to handle during anastomosis. The concept of placing an indwelling stent in the duct at cut or lacerated site is reported to have good stability during repair.¹² Vitallium wire, urinary catheter, catgut suture, and pediatric intravascular cannula are some of the materials used for cannulating the duct for its repair,

which have been reported in the previous studies.^{5,10,11} The indwelling stent in the duct demands properties like softness, flexibility, stiffness, small diameter, and adequate length. Epidural catheter with a diameter of 0.034 inch (US Patent) in accordance with ductal orifice suits ideal for this situation as it is stiff, yet flexible, and has enough length.¹³ It is easily available in the operation theater as well. All these properties prove epidural catheter as an ideal material for cannulating the duct. With this technique, the patency and immediate flow of saliva from the duct is well maintained, and hence its compression is prevented from postoperative edema. However, this needs a good patient compliance as well.

CONCLUSION

The management of parotid sialoceles has been unsatisfactory in the past, and numerous methods of treatment with varying success and morbidity have been described. Many of the principles of management are controversial however there are certain points to remember while dealing with such type of injuries:

- Magnification with operating loupes or an operating microscope during wound exploration is valuable.
- Cannulation of the duct through the orifice and passing of a small catheter into the wound isolates the distal segment of a transected duct.
- Pressing on the gland to express saliva into the wound identifies the proximal portion of the duct.
- Ductal lacerations should be repaired as early as feasible.
- Stensen's duct is located on a line drawn from the tragus to the midpoint between the upper lip margin and the columella.
- The duct is usually located just inferior to a small accompanying artery and just superior to a small accompanying branch of the facial nerve.
- Duct laceration should be suspected in all cheek wounds located lateral to a vertical line from the pupil and inferior to a line drawn horizontally at the level of the tragus.

In nutshell, use of epidural catheter for immediate diagnosing and repair of parotid duct injury can be considered innovative technique.

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