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RECANALIZATION OF THE PAROTID DUCT WITH CATHETER AFTER PERFORATING TRAUMA BY A FOREIGN BODY

RECANALIZAÇÃO DE DUCTO PAROTÍDEO COM CATETER APÓS TRAUMA PERFURANTE POR CORPO ESTRANHO

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ABSTRACT

Obstruction and injury of salivary ducts by foreign bodies are uncommon. The most common forms of trauma to the parotid duct are due to sharp objects and even if they are not frequent, these injuries must be diagnosed and treated early in order to avoid secondary problems. The aim of this study is to report a clinical case of successful diagnosis and treatment of perforating lesion in the parotid duct caused by a foreign body. A 34-year-old male patient attended the Maringá University Hospital, reporting intraoral trauma on the right side with a wooden toothpick. After clinical examination, a foreign body was found in the right cheek mucosa region and a lesion in the parotid duct. The object was removed and the duct was recanalized with a silicone catheter. The patient attended the seven-day return with the cannula in position, without signs of infection and with active saliva drainage. The use of the silicone catheter was a viable alternative in the reconstruction of the parotid duct after perforating trauma by a foreign body.

Keywords: Catheterization. Parotid gland. Wounds and injuries.

RESUMO

A obstrução e lesão de ductos salivares por corpos estranhos são incomuns. As formas mais comuns de trauma do ducto parotídeo ocorrem devido a objetos pontiagudos e, mesmo que não sejam frequentes, essas lesões devem ser diagnosticadas e tratadas de forma precoce a fim de evitar problemas secundários. O objetivo deste estudo foi relatar um caso clínico de diagnóstico e tratamento bem sucedido de lesão perfurante em ducto parotídeo, causada por corpo estranho. Paciente do sexo masculino e 34 anos compareceu ao Hospital Universitário de Maringá relatando trauma intraoral do lado direito com palito de madeira. Após exame clínico verificou-se a presença de um corpo estranho na região da mucosa jugal direita e lesão do ducto parotídeo. O objeto foi removido cirurgicamente e conduziu-se a recanalização do ducto com cateter de silicone. O paciente compareceu ao retorno de sete dias com a cânula em posição, sem sinais de infecção e com drenagem ativa de saliva. A utilização do cateter de silicone foi uma alternativa viável na reconstrução do ducto parotídeo após trauma perfurante por corpo estranho.

Palavras-chave: Cateterismo. Ferimentos e lesões. Glândula parótida.

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INTRODUCTION

Salivary gland diseases as a result of an obstructed salivary duct are common; however, when derived from obstruction by a foreign body, they are extremely rare (ABE *et al*., 1990). Injuries to the parotid duct are usually caused by trauma and may be related to sharp objects found in car accidents, or knives, razors, bottle fragments, gunshot wounds, or even to surgical procedures (JOFFE, 1967; STEINBERG; HERRÉRA, 2005; DOCTOR *et al.,* 2007; SUJEETH; DINDAWAR, 2011).

The parotid duct is on average 7 cm long and, at the anterior edge of the masseter muscle, rotates medially through the adipose body of the cheek, then penetrates the buccinator muscle and the cheek mucosa, ending in the oral cavity through small holes located bilaterally at the height of the maxillary second molars (JOFFE, 1967; STEINBERG; HERRÉRA, 2005).

Although parotid gland and parotid duct injuries represent a small percentage of general soft tissue trauma, surgeons must be attentive, since errors while recognizing and treating these injuries may lead to complications that are difficult to resolve (LEWKOWICZ; HASSON; NAHLIELI, 2002). Lewis and Knottenbelt reported that the incidence of parotid gland and parotid duct injuries account for approximately 0.21% of all trauma cases (LEWIS; KNOTTENBELT, 1991).

Parotid duct injuries that are not diagnosed early may result in secondary problems, such as infection or extraoral fistulas, for instance. The soft tissues involved in a trauma and the related salivary gland must be carefully examined, along with the branches of the facial nerve, the transverse branches, the facial artery, and the parotid duct patency. The presence of a foreign body inside this duct can obstruct the local salivary drainage (STEINBERG; HERRÉRA, 2005; DEMIAN; CURTIS, 2008).

The type of treatment for salivary duct injuries is determined by the extent of the injury. The goal of primary treatment is to recognize and treat injuries to the gland and to the duct system immediately after the trauma. Currently, it is a consensus that surgical repair of salivary duct injuries must be performed whenever possible, since the enhancement of microsurgery techniques and suture materials provide good results (LEWKOWICZ; HASSON; NAHLIELI, 2002). Complications stemming from inadequate treatment or lack of an efficient primary treatment of salivary duct injuries are much more difficult to handle (VAN SICKELS; ALEXANDER, 1981).

In this context, the limited number of publications on the diagnosis and treatment of parotid duct obstruction associated with a foreign body resulting from trauma reiterates the scientific and clinical/surgical importance of this study. Therefore, the objective of this investigation was to report a clinical case of parotid duct obstruction by a foreign body (wooden toothpick) as a consequence of intraoral trauma, and to report the surgical treatment performed.

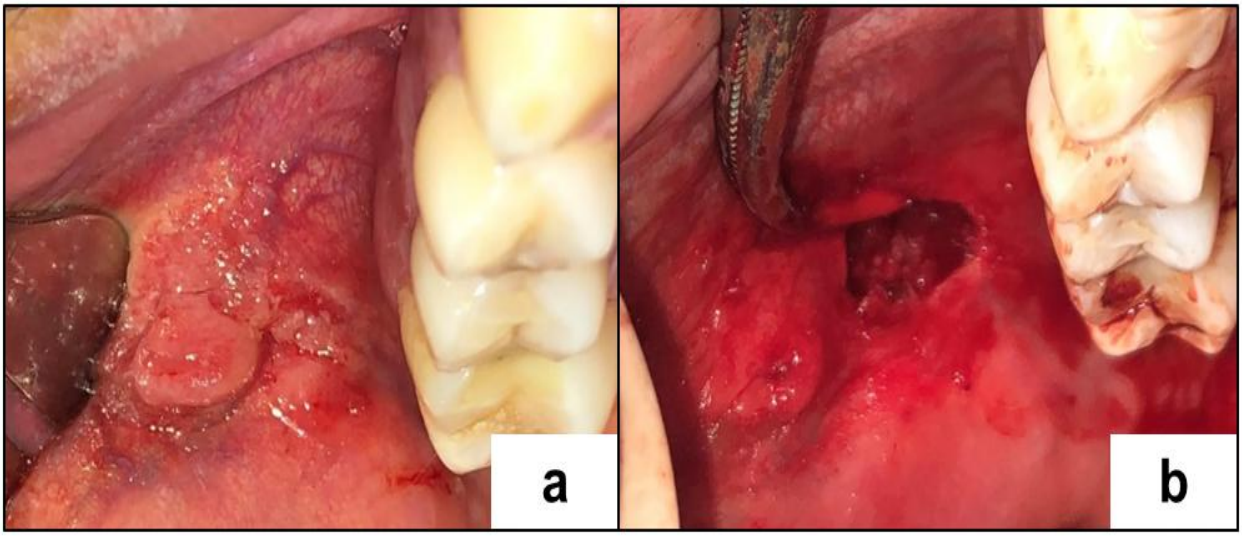
CASE REPORT

A 34-year-old male patient went to the emergency room at the University Hospital of Maringá complaining of pain and with a significant edema in the right parotid gland. A recent trauma to the right cheek mucosa by a wooden toothpick was confirmed, which, as reported by the patient, broke in half and penetrated the area. He said he was drunk at the time of the accident and did not remember whether he had removed the foreign body fully or partially from the wound. During initial care, the patient was in good general condition and denied having any comorbidities.

After extraoral physical examination, an edema was diagnosed, which caused pain when the area of the parotid gland on the right side was palpated. The intraoral examination showed multiple perforating injuries and lacerations in the right cheek mucosa, in the exit area of the parotid duct (Figure 1a). When the area was milked, no salivary flow was seen, and the presence of a foreign body was identified during digital palpation along the parotid duct path. The diagnosis of sialoadenitis resulting from parotid duct obstruction by a foreign body was confirmed. Based on that, a surgical procedure was performed, under local anesthesia, for its removal.

A 1 cm long linear incision was made in the area below the parotid duct, and the tissues were torn and separated until the duct area was found. In this stage, the presence of the foreign body perforating the duct and crossing it transversely was verified (Figure 1b).

Figure 1 - Initial appearance of the mucosa and removal of the foreign body



Notes: a) Initial appearance of the cheek mucosa on the right side. Lacerations are seen. b) Removal of the foreign body. It is possible to see the wooden toothpick being grasped by the instrument.
Source: the authors.

Immediately after the wooden toothpick fragment was carefully removed (Figure 2), it was possible to observe the drainage of serosanguinolent contents as the parotid duct was unblocked.

Figure 2 - Wooden toothpick removed

Source: the authors.

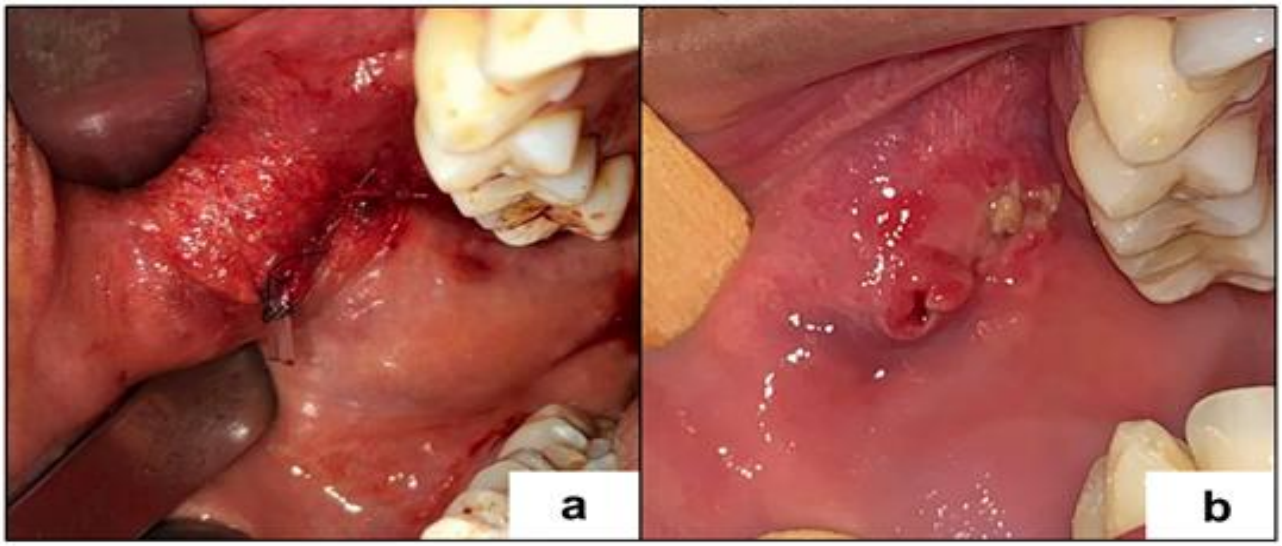
In addition to the trauma to the parotid duct, there were secondary lacerations in the area, due to the patient's attempts to remove the foreign body, which could divert the normal flow of saliva or induce the formation of unwanted fistulas. In order to recanalize the duct and reestablish the saliva drainage in the same pre-trauma site, a 16Fr silicone catheter was inserted through the duct ostium, towards the proximal area of the lacerated duct, following the normal anatomy of the

parotid duct. The catheter had its distal end fixed to the oral mucosa with a 4-0 nylon suture (Figure 3a). Finally, the tissues were repositioned and sutured with 910 4-0 polyglactin thread, so there was no tissue collapse and no new duct obstruction.

Clinically, in the immediate postoperative period, it was possible to observe a discreet salivary flow through the catheter at its distal end, and its presence in the path of the parotid duct was confirmed by ultrasound scan. The patient received postoperative instructions, antibiotic prescription (Amoxicillin, 500mg, 8/8 hours, for seven days) and analgesic prescription (Sodium Dipyrone, 500mg, 6/6 hours, for three days). The catheter was left in place for five days so that there was enough time for re-epithelialization of the injured duct and so that its path did not change.

On the seventh postoperative day, the patient showed significant edema regression, without pain complaints, without signs and/or symptoms of infection, and with good wound healing appearance; moreover, when the parotid gland was milked, a discreet salivary flow was observed in the area where the distal end of the catheter was before (Figure 3b).

Figure 3 - Immediate and 7-day postoperative period



Notes: 3a) Catheter in place and sutured, with distal portion inside the oral cavity. 3b) 7-day postoperative period. The catheter had already been removed, and the mucosa was showing no signs of infection, with good healing and active saliva drainage.
Source: the authors.

Fourteen days after the surgery, there were no more signs of edema or complaints from the patient, the wounds were healed, and the salivary flow was normalized through the exit of the parotid duct. The patient is being followed up and showing satisfactory results so far.

DISCUSSION

In cases of trauma to the parotid gland area, either extraorally or intraorally, the surgeon must proceed with a thorough local assessment, examine the anatomical structures involved and look for any foreign bodies that may be present in the lacerations. Lewkowicz, Hasson and Nahlieli (2002) state that traumatic injuries in this area can damage other important structures besides the gland itself and the parotid duct, such as the facial nerve, causing major changes in facial movements, in addition to the external ear canal and the temporomandibular joint (LEWKOWICZ; HASSON; NAHLIELI, 2002).

Traumatic injuries to the parotid duct are less frequent compared to the other ducts of other salivary glands, and can occur for several reasons. In the reported case, the trauma to the duct was caused by a wooden toothpick that had accidentally been introduced through the cheek mucosa.

Barbosa *et al*. (2012) report that among the causes of injuries to the salivary ducts, the most common is trauma by piercing and/or cutting objects (BARBOSA *et al.*, 2012).

In 1981, Van Sickles and Alexander proposed a classification for traumatic episodes in the parotid gland, which takes into account the anatomical site in which the trauma occurred: traumatic episodes that occur in the area of the parenchyma of the gland, above the masseter muscle, or anteriorly to this muscle (VAN SICKELS; ALEXANDER, 1981). In the reported case, the spot traumatized by the sharp object is in the anterior area of the masseter muscle. According to Van Sickles and Alexander (1981), injuries that occur in this area can be treated by means of techniques to restore the continuity and patency of the duct, or by creating an intraoral fistula (VAN SICKELS; ALEXANDER, 1981). In the reported case, the duct injury was closer to the duct ostium, far from the parotid gland. According to Lewkowicz, Hasson and Nahlieli (2002), when duct laceration is found close to the intraoral opening (papilla), it is easier to see and suture. However, when the laceration is closer to the gland, the identification of the proximal stump and the primary suturing of the duct are more complicated (LEWKOWICZ; HASSON; NAHLIELI, 2002).

After the diagnosis of salivary duct injury, the choice of how to handle it will depend on the injured gland, the site, the mechanism of the trauma, associated infections, possible long-term damages to the glandular parenchyma, and the professional's experience (ABE *et al.*, 1990; STEINBERG; HERRÉRA, 2005; BARBOSA *et al.*, 2012).

There are some types of treatments for parotid duct trauma described in the literature that vary from conservative to the most extreme ones, such as parotidectomy and radiation (SUJEETH; DINDAWAR, 2011). According to Abe *et al.* (1990), the surgical treatment of this condition involves duct catheterization, with the removal of the foreign body from the duct intraorally, or even the surgical excision of the gland (ABE *et al.*, 1990). In the case reported above, the choice was to perform a surgical treatment that could reestablish the function of salivary drainage in the short and long term. To this end, the foreign body was carefully removed, and a catheter was placed so that the parotid duct could be re-epithelialized, and its patency could be restored. The results of the surgery were satisfactory, since, following seven days, there was salivary fluid drainage and no postoperative complications or complaints from the patient.

Lewkowicz, Hasson and Nahlieli (2002) also reported a case of parotid duct catheterization when repairing a trauma to the parotid gland area. These authors used a pediatric intravenous catheter, which allows finding the course of the duct, thus preventing it from being injured (LEWKOWICZ; HASSON; NAHLIELI, 2002). However, according to Demian and Curtis (2008), injuries that require suturing and a stent in the more proximal area of the duct may not be reachable with a pediatric catheter (DEMIAN; CURTIS, 2008). In this sense, using a 16Fr silicone catheter, as done in the case reported above, has a greater advantage over that of the pediatric catheter, since the former has an adequate length that reaches areas closer to the parotid gland.

Likewise, Barbosa *et al*. (2012) reported a case in which parotid duct catheterization was performed using a 20Fr Jelco catheter, after fibroepithelial hyperplasia removal, which also resulted in active saliva drainage (BARBOSA *et al.*, 2012). These cases show us that using a catheter to reestablish normal salivary flow is a good treatment alternative when the parotid duct is injured.

Nahlieli and Baruchin (2000), in a long-term experiment, analyzed the diagnosis and endoscopic treatment of a sample of 236 salivary glands whose ducts were suspected of being obstructed. The authors listed three reasons that justify salivary duct catheterization, namely: 1) to prevent obstruction of the ductal lumen by postoperative edema; 2) as a stent; and 3) to allow calculus particles after lithotripsy to be washed away by saliva (in cases of salivary duct obstruction by calculus). The only absolute contraindication to this technique refers to cases of acute sialadenitis (NAHLIELI; BARUCHIN, 2000). Analyzing the case presented, we can state that using the silicone cannula brought satisfactory results, as it helped in the maintenance of the parotid duct, in addition to promoting good salivary flow function.

If they are not diagnosed early, parotid duct injuries, especially those that cause obstruction, may result in secondary infections, fistulas, cysts or sialoceles (SUJEETH; DINDAWAR, 2011;

BARBOSA et al., 2012). According to Steinberg and Herréra (2005), the late formation of a sialocele is usually harder to resolve, and there is no consensus on the best therapy. A sialocele as an early or late complication originating from the parenchyma of the gland seems to have a better prognosis when compared to one originating from injuries to the salivary duct (STEINBERG; HERRÉRA, 2005).

Thus, it is extremely important that a correct diagnosis and treatment of traumas is provided as soon as possible, since late therapies may be more complex and present less predictable results.

CONCLUSION

Perforating injuries to the parotid duct, caused by an inadvertent introduction of a foreign body that blocks it, can be treated surgically with the aid of a silicone catheter to recanalize the injured portion. In addition to being safe, this alternative proved to be simple and efficient in restoring the parotid duct and its patency in the reported case. The proximity of the compromised ductal portion to its ostium, more distal in relation to the parotid gland, seems to favor this approach.

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