Original Article

Parotid Duct Repair by Facial Vein Graft versus Gore-Tex, A Sialographic Evaluation

Gheisari R.*, Mohamadinezhad C.*, Mehravaran R.*, Ziaei M.*

*Dept. of Oral and Maxillofacial Surgery, School of Dentistry, Shiraz University of Medical Sciences, Shiraz Iran.

ABSTRACT

Statement of Problem: The most common method for parotid duct anastomosis is suturing. A ductal defect of greater than 1 cm may prevent a direct anastomosis.

Purpose: The goal of this study was a sialographic evaluation to compare repairing a parotid duct with facial vein graft versus Gore-Tex tub in 19 dogs.

Material and Methods: Nineteen dogs were studied in this experimental trial. Extra oral transverse incisions were made in buccal regions bilaterally to expose parotid ducts and a defect (2 cm) was performed in similar areas (right and left). The right resected duct was repaired with facial vein graft and the left anastomosis was performed by using the Gore-Tex tube microscopically. Sialography was used to evaluate the ductal leakage. Statistical analysis was performed, using SPSS software and McNemar’s test.

Results: Based on the sialography evaluation; the ductal leakage was seen in five cases (26.31%) on the right side and in seven cases (36.84%) in the left side. Statistical analysis using McNemar’s test suggested no statistically significant difference between ductal leakages in right and left parotid ducts (p > 0.05).

Conclusion: The results of this study suggest that the efficacies of Gore-Tex tube and vein graft in parotid duct anastomosis are similar, but the use of Gore-Tex tube had a number of advantages, including reduced morbidity of the graft and short operation time.

Cite this article as: Gheisari R., Mohamadinezhad C., Mehravaran R., Ziaei M. Parotid Duct Repair by Facial Vein Graft versus Gore-Tex, A Sialographic Evaluation. J Dent Shiraz Univ Med Sci 2013; 14(2):53-56.
creased surgical time and easy availability. One of the alloplastic materials that have been used for duct or lumen reconstruction is polytetrafluoroethylene (PTFE). PTFE is considered as a physiologically inert material that can be mechanically expanded. This property is widely used to produce micro porous membranes such as Gore-Tex. [7- 8].

Therefore, the researchers have focused on the methods with better efficiencies and less complications. In addition, no indication in the published studies supports the efficacy of alloplastic tubes in the parotid duct anastomosis. In this study, the efficacy of Gore-Tex tube in parotid duct anastomosis was compared to the facial vein graft.

Material and Methods

Nineteen dogs (of the same breed and gender) were studied in this experimental trial. Intravenous Cephalothin (1 g) and intramuscular dexamethasone (8 mg) were administered preoperatively for all cases and local antibiotic was administered postoperatively. Extra oral transverse incisions were made in buccal regions bilaterally to expose parotid ducts (Figure 1).

Subsequently, a ductal defect, sized 2 cm, was performed in similar areas (right and left). The right resected duct was repaired with right facial vein graft and the left anastomosis was performed, using Gore-Tex tube (GT; W.L.Gore and Associates, flagstaff, AZ). All anastomosis was done by an end-to-end anastomosis technique with 8-0 nylon sutures microscopically. The operation time was measured in all cases for two methods. Twenty one days after the operation, sialography was performed to evaluate the quality of the anastomosis repair and ductal leakage (Figure 2). The parotid ducts were inspected by radiographic examination after the injection of contrast medium (Meglumine; Daroupaksh, IRAN) into the right and left ducts by a fine intravenous line tube from the duct papillae. Statistical analysis of the obtained data was performed using SPSS version 11.5 (SPSS, Chicago, IL) and the McNemar’s test. The differences with P values less than 0.05 were considered statistically significant.

Results

Nineteen dogs (with similar race and sex) were studied. Twenty one days after operation, sialography was performed to evaluate the operation outcomes.

Right and left ductal leakage was found in 5 cases (26.31%) and 7 cases (36.84%) respectively.

It was shown that the duration of parotid duct repair with vein graft was more than anastomosis with tube.

Statistical analysis of the obtained information, using McNemar’s test suggested no statistically significant difference between the ductal leakages in right and left parotid ducts ($p > 0.05$).

Discussion

There are many studies about the use of prosthetic tubes for vascular defects reconstruction in micro vascular surgery field. These studies have reported a variety of success rate.

We found ductal leakage in 5 cases using vein grafts and in 7 cases using Gore-Tex anastomosis but, there was no statistically significant difference between
two methods ($p > 0.05$). This is probably because of a better healing process of the gap space that is present in the vein - duct anastomosis area. Patency rates over 5 years of the axillary artery repair with PTFE graft ranges from 30 to 80 % [9]. Some authors have reported 57% 5-year patency whereas others have found a high rate of re-infection and low patency which required re-intervention [10].

Kedora and colleagues [11] conducted a prospective randomized study, comparing the PTFE stent grafts with femoro-popliteal bypass. The PTFE stent graft had a 1-year patency rate comparable to the surgical bypass, with a significantly shorter hospital stay [11].

A meta-analysis study suggests unsatisfactory results when PTFE-coated grafts were used for bypassing to the infra-popliteal arteries [12].

Some studies compared the human umbilical vein (HU) with PTFE and saphenous vein and showed that HUV was better than PTFE but worse than saphenous vein in terms of 5-year patency [13-14].

Although prosthetic grafts are readily available, easy to handle and do not require extensive dissection to harvest; their propensity to undergo thrombosis and develop neo-intimal hyperplasia makes them a less favourable alternative when compared to the vein grafts [15].

According to the aforementioned studies, prosthetic graft occlusion may have more severe consequences than the vein graft occlusion. However, if vein is truly unavailable; PTFE would the best option for the vascular bypass.

Ichihara et al. [16] believed that short-distance nerve defects in humans can be successfully treated by alloplastic tubes as an artificial nerve guides; in contrast, Pitta [17] and colleagues have not recommended the use of Gore-Tex tube in trigeminal nerve branches reconstruction because of the poor outcomes.

**Conclusion**

This study suggest that the efficacies of Gore-Tex tube and vein graft in parotid duct anastomosis are similar, but the use of Gore-Tex tube had a number of advantages including reduced graft morbidity and short operation time. Future randomized, controlled experimental and clinical trials with more samples and long follow-up periods are necessary to validate if the PTFE tube is comparable with the autogenous vein for parotid duct repair.

**References**

[1] Fonseca RJ, Betts NJ. Oral and Maxillofacial Trauma. 3th ed., New York: Elsevier Saunders; 2005. p. 864-873.

[2] Ghoreishian M, Gheisari R. Parotid duct repair with suturing and anastomosis using tissue adhesive, evaluated by sialography: an experimental study in the dog. J Oral Maxillofac Surg 2009; 67: 1191-116.

[3] Peterson LJ, Ellis E III, Hupp JR, et al. Contemporary Oral and Maxillofacial Surgery. 4th ed., St Louis: Mosby; 2003. p. 438-441.

[4] Stevenson JH. Parotid duct transection associated with facial trauma: experience with 10 cases. Br J Plast Surg 1983; 36: 81-82.

[5] Stonebridge PA, Prescott RJ, Ruckley CV. Randomized trial comparing infrainguinal polytetrafluoroethylene bypass grafting with and without vein interposition cuff at the distal anastomosis. The Joint Vascular Research Group. J Vasc Surg 1997; 26: 543-550.

[6] Lewkowicz AA, Hasson O, Nahlieli O. Traumatic injuries to the parotid gland and duct. J Oral Maxillofac Surg 2002; 60: 676-680.

[7] Dellon AL, Crawley WA. Nerve reconstruction with alloplastic material in the head and neck region. Oral Maxillofac Clin North America 1992; 4: 527-533.

[8] Pogrel MA, McDonald AR, Kaban LB. Gore-Tex tubing as a conduit for repair of lingual and inferior alveolar nerve continuity defects: a preliminary report. J Oral Maxillofac Surg 1998; 56: 319-321.

[9] Martin D, Katz SG. Axillofemoral bypass for aortoiliac occlusive disease. Am J Surg 2000; 180: 100-103.

[10] Patel A, Taylor SM, Langan EM 3rd, Snyder BA, Cull DL, Sullivan TM, et al. Obturator bypass: a classic approach for the treatment of contemporary groin infection. Am Surg 2002; 68: 653-658.

[11] Kedora J, Hohmann S, Garrett W, Munschaur C, Theune B, Gable D. Randomized comparison of percutaneous Viabahn stent grafts vs prosthetic femoral-popliteal bypass in the treatment of superficial femoral arterial occlusive disease. J Vasc Surg 2007; 45: 10-16.

[12] Albers M, Battistella VM, Romiti M, Rodrigues AA, Pereira CA. Meta-analysis of polytetrafluoroethylene bypass grafts to infrapopliteal arteries. J Vasc Surg 2003; 37: 1263-1269.
[13] Johnson WC, Lee KK. A comparative evaluation of polytetrafluoroethylene, umbilical vein, and saphenous vein bypass grafts for femoral-popliteal above-knee revascularization: a prospective randomized Department of Veterans Affairs cooperative study. J Vasc Surg 2000; 32: 268-277.

[14] Fahner PJ, Idu MM, van Gulik TM, Legemate DA. Systematic review of preservation methods and clinical outcome of infrainguinal vascular allografts. J Vasc Surg 2006; 44: 518-524.

[15] Steinberg MJ, Herrera AF. Management of parotid duct injuries. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2005; 99: 136-141.

[16] Ichihara S, Inada Y, Nakamura T. Artificial nerve tubes and their application for repair of peripheral nerve injury: an update of current concepts. Injury 2008; 39 Suppl 4: 29-39.

[17] Pitta MC, Wolford LM, Mehra P, Hopkin J. Use of Gore-Tex tubing as a conduit for inferior alveolar and lingual nerve repair: experience with 6 cases. J Oral Maxillofac Surg 2001; 59: 493-496.
