Correction of Postpalatoplasty Hard Palatal Fistula: Anterior Approach with Interpositional Conchal Cartilage Graft

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Background/purpose: Attempts at closure of hard palatal fistulae following the repair of cleft palate have been associated with significant failure rate that increased with second or further trials of closure. We proposed the anterior approach and free conchal cartilage as an interpositional graft to repair postpalatoplasty medium and large hard palatal fistulae.

Patients and Methods: This study included 16 patients (aging between 2 and 18 years) with postpalatoplasty hard palatal fistula that were repaired through an anterior approach to elevate the palatal mucoperiosteal flap, closure of the defect with a free conchal cartilage interpositional graft.

Results: Complete closure was achieved in 13 patients (81.25%), and the failure rate was increasing when previous surgical interventions were tried to close the fistula. Postoperatively we didn’t record any donor site related complications or recurrence of the repaired fistulae on follow up for six months.

Conclusion: The proposed approach is simple, can be completed as a day surgical procedure but larger number of cases and long follow up are needed for proper evaluation of the presented technique.

Index Word: Cleft palate repair, hard palatal fistula, anterior approach, conchal cartilage graft.

INTRODUCTION

The closure of a residual postpalatoplasty hard palatal fistula can be among the most difficult of all surgical techniques and remains challenging. No single technique is satisfactory and attempts at closure of these fistulae have been associated with failure rates around 37 percent 1, 2 and even as high as 65 percent in some series3, increasing with the second or further trials. 3

Postpalatoplasty hard palatal fistulae have been classified by Schultz 3 as pinpoint, slit, oval or total dehiscence, while others1, 2 classified it according to the size as small (<3mm), medium (3-5mm), or large (>5mm). Ideally, fistulae should be closed if regurgitation of a solid food particles in the nostrils, speech or social problems arise.4,5 Extensive animal and clinical studies were carried out using the free conchal cartilage as an interpositional graft to repair small fistula while many authors combined it with local flaps in larger fistulaes.6-9 Other centers described an anterior approach with total elevation of the palatal mucoperiosteal flap and repair of the nasal...
and oral fistulous defects under vision with overall success rate up to 96.9 percent for previously unoperated fistulae, while it was 82.1 percent in the previously operated fistulae group.10

In the light of the earlier works on the free conchal graft and the anterior approach for correction of the palatal fistula, we proposed our combined technique using the anterior approach with interpositional free conchal cartilage graft to repair medium and large postpalatoplasty hard palatal fistula.

MATERIALS AND METHODS

This study included 16 patients aged between 2 and 18 years; having medium and large postpalatoplasty hard palatal fistulae. They were admitted to Plastic and Reconstructive Surgery Unit and ENT Department, Tanta Faculty of Medicine, Egypt during the period from February 2003 and January 2005. These patients were selected from 23 cases after exclusion of the patients who were operated upon for primary cleft palate repair with reconstructive procedures, small fistula or had alveolar cleft.

The age of the operated cases ranged from 2-18 years. The majority of the studied patients (9 of 16) had left sided cleft lip palate while none of them were operated for bilateral cleft lip palate. History was taken emphasizing on clinical presentation, age at the primary palatal repair, sex, associated reconstructive procedure during the previous operations, previous attempts at closure of the fistula and the complaints of the patients or the relatives regarding the fistula (leaking of the fluids, milk, chocolate, particles of hard foods or air through the nose, speech or hearing problems).

Full ENT evaluation of the patients was carried out which included nasal endoscopy for evaluation of the palatal fistula size from the nasal side and exclusion of associated complications or pathological conditions such as deviated nasal septum, adenoid hypertrophy or chronic sinusitis. The least postoperative period between the previous operation of either primary palatoplasty or an attempt to close a fistula and our intervention to close the hard palatal fistula was six months or more.

Surgical technique

All surgical repairs were done under general endotracheal anaesthesia supplemented with local anaesthesia of 1 percent lidocaine in 1:100,000 epinephrine and a prophylactic dose of antibiotic as a third generation Cephalosporin (cefotaxime 50mg/kg/day). The fistula was evaluated under general anesthesia and cannulated with a suitable curved metal probe to localize the defect and the limit of dissection and to evaluate approximately the size of the fistula (Fig. 1). Palatal mucoperiosteal flap was elevated starting at the apex of the gingival sulcus of each tooth and the dissection was proceeded posteriorly beyond the fistula to adapt the interpositional graft freely using a sharp edged periosteal elevator (Fig. 2).

The fistula was excised to separate the nasal from the oral mucosa at the plane of the palatal bone. Closure of the nasal part of the fistula was completed under vision with one or two interrupted 5/0 Vicryl sutures, when possible. The oral defect of the fistula tract was trimmed and repaired with 4/0 or 5/0 Vicryl sutures in all cases. After closure of the oral lining, conchal cartilage graft was harvested from the patient’s ear through a postauricular incision and was configured to fit the defect with about 10 percent excess all around (Fig. 3). The cartilage graft was fixed to the oral mucosa with 4/0 Vicryl sutures (Fig. 4, 5).

Haemostosis was secured and the palatal mucoperiosteal flap was reflected and fixed using interdental interrupted 3/0 or 4/0 Vicryl sutures starting posteriorly and advancing anteriorly to complete our procedure, keeping the dental papillae in their original position (Fig. 6). No raw area was left and the patient was kept on milk, juices, fluids or soft diet for one to two weeks.

RESULTS

There were 11 patients with large (>5mm) fistulae and five with medium (3-5mm) fistula. Fourteen out of 16 patients had hard palatal fistula. The fistulae were located at the junction between hard and soft palate in 2 patients. The initial procedure was Furrolow palatoplasty in 11 cases and von Langenbeck procedure in five patients. For repairing hard palate fistula postpalatoplasty local flaps were used in 14 cases while in two cases distally based tongue flap was used to close large fistula.
Fig 1. The fistula was evaluated under general anesthesia.

Fig 2. Palatal mucoperiosteal flap was elevated through anterior approach.

Fig 3. The free conchal cartilage graft to be harvested from patient’s ear.

Fig 4. Free conchal cartilage graft was fixed as an interpositional layer.

Fig 5. The palatal mucoperiosteal flap was reflected and fixed using interdental interrupted stitches with repaired oral mucosa.

Fig 6. Postoperative follow up in another patient with healed oral opening.
In four patients our procedure was the first attempt to close the fistulae, in three cases it was the second trial. The other nine patients were operated upon more than two times to close the fistula - elsewhere with local flaps and were referred to our specialized centers.

The ages of the studied cases ranged from 2 to 18 years and the average age of those with failed repair was 4.26 years (2-10 years) versus 7.38 years (2-18 years) for the successful repair. The majority of our patients (14 of 16) had hard palatal fistulae while only (2 of 16) were suffering from fistula at the junction between hard and soft palate. The main complaint among the studied patients was regurgitation of solid particles as rice grains in the nostril denoting medium or larger fistula.

The mean operative time was 60 ± 15 minutes and the hospitalization period ranged from few hours to five days postoperatively. The successfully repaired cases stayed at the hospital for few hours to one day while the failed trials needed two to five days.

Successful hard palatal repair was achieved in 13 of 16 cases (81.25 %). The failure rate was 18.75 percent (3 of 16). Among the failed repaired cases, two patients were previously operated for fistula closure while one patient had the first trial to close a large fistula (15mm) that was located at the junction between hard and soft palate.

The average age of the patients with failed repair was 4.26 years (2-10 years) versus 7.38 years (2-18 years) for the successfully repaired cases.

On follow up, we didn’t observe any complications related to the donor area as ear asymmetry, cartilage weakness or hypertrophic scarring at the line of incision. Six months postoperatively we didn’t record any signs or symptoms denoting fistula recurrence among the successfully repaired cases.

DISCUSSION

Attempts at closure of postpalatoplasty hard palatal fistulae have been associated with failure rate up to 37 percent that increased with second or further trials.1, 3 Local flaps11 have been used for fistula closure but the rigidity of the palatal mucosa, especially if it is already scarred, still presents a challenge to the reconstructive surgeon that called to more complicated techniques with all its difficulties and drawbacks.12-17

Interpositional grafts of bone12,18 free peristomeum19, fatty dermal graft 20 and conchal cartilage graft 6,8,9 to separate the oral and nasal layers and to complete a three-layered closure, have also been reported with better success rates. The three-layered repair provides more safety margin in cases of partial repair disruption than the conventional two-layered procedures.18

Some authors reported the anterior approach by total palatal elevation as mucoperiosteal flap for fistula closure and reported success rate of fistula repair as high as 96.9 percent in the first attempt at fistula closure and 82.1 percent in the previously operated fistulae group. They claimed that the repair was completed with minimal tension preventing secondary scarring over the exposed palatal bone which may interfere with arch growth, alignment and orthodontic treatment. 21, 22

Based on the previous published studies, we proposed a combined technique using an anterior palatal mucoperiosteal flap with conchal cartilage graft as an interpositional layer. In each patient the palatal mucoperiosteal flap was elevated, the fistula was excised and the oral defect was closed. The nasal defect was repaired whenever feasible. A conchal cartilage graft harvested from patient’s ear was used as interpositional graft; the mucoperiosteal flap was reflected and fixed with interdental sutures without leaving any raw areas.

The success rate of repair of fistula in the current study was 81.25 percent while in the literature reported success rates with closure of post palatoplasty hard palatal fistulae were in the approximated range of 33 to 37 percent 1,2. When local flaps were used the success rate markedly increased to 79 percent with interpositional conchal cartilage graft8. Others used sandwich techniques to close the fistula as a day surgical procedure and didn’t report any recurrence after two months follow up. 7,20,23,24

Most authors consider the closure of the nasal mucosal layer as an essential step in their technique for repair of palatal fistula,1,7,10 while other contested this with variable success rates. 20,8,25

In the current technique, circumferential incision offered the added advantages of maximizing tissue for palatal repair with minimal tension, preventing secondary scarring over the exposed palatal bone, increased the arc of available tissue for repair and
enabled us to close the oral mucosa in all patients under vision. The addition of the conchal cartilage graft as interpositional layer added more security for fistula closure and enhanced the success rate in our hands.

CONCLUSION

The preliminary results of correction of hard palatal fistula in our series proved that this technique is simple, can be performed as a day surgical procedure. The fistula can be easily dissected, and the defects at both oral and nasal mucosa can be repaired with minimal tension. The sandwiched conchal cartilage graft adds more security to the repair with enhanced success rate. However, more number of patients and longer follow up periods are required before declaring a final conclusion.

REFERENCES