TITLE:
Assessment of Palatal Fistula Repair Using a Conchal Cartilage Graft

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Assessment of Palatal Fistula Repair Using a Conchal Cartilage Graft

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Yoshio Yamawaki, Masato Kurokawa, Nobuhiko Isshiki,
Tomoko Hanawa and Michio Kawano

INTRODUCTION

The usefulness of free conchal cartilage grafts for the reconstruction of lower eyelid ectropion, augmentation rhinoplasty, nose deformity resulting from cleft lip and recently for repair of palatal fistula, has already been reported by several authors (1), (2), (3), (5), (6), (7), (8)). The aim of the present study was to compare conchal cartilage graft to traditional methods used for repair of palatal fistula associated with palatoplasty in our clinic (4), (5). Thirteen patients with palatal fistula after primary palatoplasty were evaluated post-operatively. These subjects had undergone operative repair of a palatal fistula using a free conchal cartilage graft with or without a local mucosal flap. The result of the operation, speech intelligibility before and after surgery, and aerodynamic characteristics were assessed.

SUBJECTS

Thirteen patients diagnosed with palatal fistula at our special cleft palate outpatient clinic were evaluated (Table 1, 2). One of these patients had cleft palate alone, while the others had cleft lip and palate. Among the latter group were three patients with bilateral cleft lip and palate. Patient age ranged from 3 to 24 years.

CRITERIA FOR PALATAL REPAIR SURGERY

Indications for palatal repair surgery were:
1) Fistula diameter of at least 5 mm,
2) Midline fistula location with velopharyngeal dysfunction or faulty articulation
and nasal snorting resulting from fistula,
3) Patient discomfort due to passage of food and liquids through the fistula into
the nasal cavity,
4) Aerodynamic evidence of increase of intraoral pressure as a result of fistula ob-
turation.

**Surgical Procedure**

The incision line was established along the anterior aspect of the anti-helix of the
auricle (Fig. 1). Before incision lidocaine with epinephrine was injected just above
the perichondrium to facilitate undermining of the conchal cartilage.

The mucosal flap was moved over the fistula and turned over to close the nasal
side (Fig. 2). A deep pocket for insertion and fixation of the conchal cartilage was
created. This procedure is important to a successful outcome. Through to Through
suturing was performed (Fig 3, 4, 5). In the case of anterior palatal fistula, a trans-
positioned vestibular-mucosal flap was applied to cover the grafted cartilage. When
the fistula was located in the posterior part of the palate, a tie-over fixation was usually
used.

The surgical field was covered with a acrylic prosthesis to prevent infection.
If necessary, the conchal cartilage was flattened by cross-hatching.
Fig. 1. The incision line was placed along the anterior aspect of the anti-helix.

Fig. 2. The nasal side of palatal fistula was closed with turnover flap.

Fig. 3. The conchal cartilage was inserted into the deep pocket around the palatal fistula.

Fig. 4. The conchal cartilage was tightly fixed using through to through suturing.
RESULTS

The surgical results were evaluated as "good", "fair", or "poor" in comparison to results previously obtained in our clinic.

Complete fistula closure was graded "good". "Fair" signified that an asymptomatic narrow fistula remained, while "poor" designated a failure to repair the fistula. In the present study all of the cartilage implants produced results that were fair or good (Table 3). Pre-and post-operative aerodynamic results and speech intel-

Table 3. Operative procedure for repair in palatal fistula and results.

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Operation Methods</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C</td>
<td>Fair</td>
</tr>
<tr>
<td>2.</td>
<td>C+V</td>
<td>Good</td>
</tr>
<tr>
<td>3.</td>
<td>C</td>
<td>Good</td>
</tr>
<tr>
<td>4.</td>
<td>C+V</td>
<td>Good</td>
</tr>
<tr>
<td>5.</td>
<td>C</td>
<td>Good</td>
</tr>
<tr>
<td>6.</td>
<td>C</td>
<td>Fair</td>
</tr>
<tr>
<td>7.</td>
<td>C</td>
<td>Fair</td>
</tr>
<tr>
<td>8.</td>
<td>C</td>
<td>Fair</td>
</tr>
<tr>
<td>9.</td>
<td>C</td>
<td>Good</td>
</tr>
<tr>
<td>10.</td>
<td>C</td>
<td>Fair</td>
</tr>
<tr>
<td>11.</td>
<td>C</td>
<td>Good</td>
</tr>
<tr>
<td>12.</td>
<td>C+V</td>
<td>Good</td>
</tr>
<tr>
<td>13.</td>
<td>C+V</td>
<td>Good</td>
</tr>
</tbody>
</table>

C = Conchal cartilage
V = Vestibular mucosal flap
Table 4. Aerodynamic study for palatal fistula patients with velopharyngeal incompetence.

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>pre-operation</th>
<th>post-operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number VPR</td>
<td>Hyper nasality</td>
<td>VPR Hyper nasality</td>
</tr>
<tr>
<td>6. M.Y.</td>
<td>4.2 +</td>
<td>371.4 -</td>
</tr>
<tr>
<td>11. S.M.</td>
<td>86 +</td>
<td>605 -</td>
</tr>
<tr>
<td>13. S.K.</td>
<td>107.7 +</td>
<td>2319 -</td>
</tr>
</tbody>
</table>

VPR = velopharyngeal resistance (dyne·sec/cm²)

Table 5. Speech intelligibility before and after palatal repair operation with faulty articulation patients.

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>pre-operation</th>
<th>post-operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Y.S.</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>6. M.Y.</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>8. K.K.</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

5: faulty articulation for some consonants
4: distorted on some consonant production
3: slightly distorted on some consonant production
2: almost normal
1: normal

Discussion

The problems of speech associated with palatal fistula commonly depend on loss of intraoral air pressure and audible nasal escape. Hypernasality is also one of the symptoms associated palatal fistula. Fiberoptic examination and aerodynamic analysis with temporary closure of the palatal fistula with an obturator indicated velopharyngeal activity improvement. Therefore, the size and location of the palatal fistula should be carefully examined before a fistula repair operation. In addition, fluid and food regurgitation into the nasal cavity through the palatal fistula are major problem for the patient’s quality of life. This aspect receives careful attention our clinic. The most common location of the palatal fistula is the anterior region of the hard palate, and on mid line with a defect of palatal bone in the cleft palate patient. To prevent fistula formation in primary palatoplasty, Ishiiki has described turning over the flap to double the closure layer of the anterior region of the cleft palate, and results have been satisfactory. Unfortunately, several cases have resulted in palatal fistula after primary palatoplasty, in particular cases of bilateral cleft lip and palate. The incidence of palatal fistula has been reported by many authors, operator’s skill may account for differences in incidence. A number of methods to close the palatal fistula after primary palatoplasty have been described, including mucosal flap, mucoperiosteal flap, free mucosal graft in the case of small fistula, and tongue flap for large fistula. The problem of fistula repair surgery is the existence of an area of avascular scarring around the fistula. Failure of
Table 6. The result of using conchal cartilage grafting versus our previous report.

<table>
<thead>
<tr>
<th></th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Previous Report</td>
<td>12</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Conchal cartilage</td>
<td>8</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

*=Vestibular mucosal flap, Mucoperiosteal flap and free mucosal graft not included tongue flap. (Palatal Fistula Repair. Studia Phonologica, XXIII, 1989)

fistula closure, such as necrosis of the flap commonly resulted from excessive tension, careless suturing, and infection. In this study, palatal repair was performed using not only a local mucosal flap but also conchal cartilage with perichondrium grafting. The cartilage is protected from infection and epithelization is soon seen. The result of using cartilage is satisfactory compared to our previous report (Table 6). The cases grading “fair” in this study were found to result from immediate loss of grafting cartilage. To prevent the early loss of the grafting cartilage, through to through suturing and air tight shield fixation between cartilage and mucosal flap are necessary. For palatal fistula located in the anterior region of palate, it is possible to cover the surface of the grafted cartilage by using a vestibular transposition of the mucosal or musculo-mucosal flap. Mucosal-flap covering provides a good result compared with tie over covering of the cartilage. A palatal fistula diameter of less than 5 mm is a good indication for the use of conchal cartilage graft alone. However, by using a conchal cartilage together with a local mucosal flap, in particular a buccal transposition flap, it is possible to close a fistula of more than 5 mm in the anterior region of the palate. The success of this operation depends on 1) Excision of an adequately large conchal cartilage with perichondrium, 2) Air tight shield fixation, 3) Through to through mattress suturing, 4) Covering the implanted cartilage.

**SUMMARY**

The result of Palatal fistula repair surgery in thirteen patients were assessed.

In the present study all of the conchal cartilage implants produced results that were fair or good. The result of using cartilage is satisfactory compared to our previous study.

The Usefulness and advantages of conchal cartilage graft for repair of palatal fistula were discussed. The success of this operation summarized as follows: 1) Excision of an adequately large conchal cartilage with perichondrium, 2) Air tight shield fixation, 3) Through to through mattress suturing, 4) Covering the implanted cartilage.

**REFERENCES**


