Secondary Bone Grafting in Cleft Palate: A Follow up of 145 Patients

KARL-ERIK HOGEMAN, M.D.
STEN JACOBSSON, M.D.
KARL-VICTOR SARNÄS, M.S., O.D.

The use of a bone graft in the repair of the alveolar process in cleft palate is now a well-established practice (2, 3). The operation is performed either early at the time of lip closure ("primary repair") or later ("secondary repair"). Since 1961 we have performed secondary repairs at an age when orthodontic treatment has secured a normal relationship between the upper and lower dental arches, i.e. normal occlusion, and the results are presented below.

Procedure

CLINICAL MATERIAL. The series consisted of 145 consecutive patients (105 males and 40 females), aged 3 to 49 (mean ages: males 16.5 and females 14.8). They were treated at our departments during 1961–1969. Only the first secondary operation is considered here, thus no re-operations. The clefts were unilateral in 80 males and 29 females and bilateral in 25 and 11, respectively. In the males the unilateral clefts were left-sided in 57 (71%) and in the females in 19 (66%). The sex distribution of the unilateral and bilateral clefts corresponded closely to that found by Fogh-Andersen (1) in a Danish population.

CLINICAL EXAMINATION. The patients were subjected to clinical examination, including roentgenography, just before and immediately after and 3, 6 and 12 months after operation. No orthodontic or prosthodontic treatment was allowed during this period. The operation was considered successful if the radiographs showed complete bony union, if no fistulae were found between the oral and nasal cavities, and if no change in occlusion was observed.

PREOPERATIVE ORTHODONTIC TREATMENT. To secure normal occlusion the patients received pre-operative orthodontic treatment, usually with a fixed appliance, for about a year. Treatment was usually started after eruption of the permanent teeth. In 7 patients with severe anomalies of the jaws the orthodontic treatment was started earlier regardless of the stage of dental maturation.

Dr. Karl-Erik Hogeman is head of the Department of Plastic Surgery, University Hospital, Malmö, Sweden. Dr. Sten Jacobsson is assistant head of the Department of Plastic Surgery, University Hospital, Malmö, Sweden. Dr. Karl-Victor Sarnäs is head of the Jaw Centre, University Hospital, Malmö, Sweden.
Surgical Treatment. The alveolar bone in the cleft was surgically exposed. If a fistula was present, the nasal mucosa was dissected to permit suturing. Bone was planted in the cleft and covered with palatal and buccal flaps. Bilateral clefts were operated upon at a single sitting. Until 1963 that bone grafts were obtained from ribs. After that time spongy bone from the iliac crest was used. During the last few years the operation was extended to include planting of a spongy bone graft (buccal bar) on the buccal side of the alveolar ridge to cover the defect. The buccal bar was long enough to allow good contact with the bare alveolar bone on both sides of the cleft. After the flaps had been sutured a removable retention plate was inserted and worn for at least 6 months. This plate not only protected the operation area from the tongue but also retained the dental segments in position. The patients usually spent about 10 days in hospital, during which most of them received antibiotic therapy. After the operation the patients were encouraged to keep as high a standard of oral hygiene as possible, a measure which sometimes prolonged hospitalization.

Results

The operation was successful in 11 (34%) of the 32 patients, where rib bone was used, in 41 (58%) of the 71 where spongy bone of the iliac crest was used, but in as many as 41 (98%) of 42 in whom a buccal bar was added (Figure 1). These groups did not differ significantly from one another in age and sex distribution (Table 1). Neither did the results of the operation appear to vary with age or sex.

Discussion

In 1961 a program at the University Hospital, Malmö, was set up for the treatment of patients with cleft lip and palate. Perusal of the literature then available revealed no convincing evidence arguing in favour of early or of late repair of the cleft palate with bone graft. Since early operation might interfere with maxillary growth and development it was decided not to operate until growth and development of the premaxillary region was almost complete. The use of grafts from the iliac crest instead of from the ribs raised the frequency of successful operations from 34% to 58% and with subsequent addition of a buccal bar, to 98%. A further advantage of the buccal bar was that it improved the appearance of the lip.

Those 7 patients, aged 3–6 years, who received orthodontic treatment to correct an incipient malocclusion, were thus operated upon during the active growth period. They belonged to the first group of the series and have been followed up for several years. In three instances the operation was successful but clinical and radiographic follow up showed a deepening of the groove indicating that the growth of the graft had not kept pace with that of the adjacent alveolar bone (4). Today we refrain from early
FIGURE 1. Incidence of successful (unfilled) and unsuccessful (striped) operations in 145 patients in relation to the type of bone graft, sex and type of cleft (left sided cleft = L, right sided = R and bilateral = L + R.)

TABLE 1.

<table>
<thead>
<tr>
<th></th>
<th>rib</th>
<th>iliacc crest</th>
<th>iliacc crest + buccal bar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>males</td>
<td>15.4</td>
<td>15.5</td>
<td>18.2</td>
</tr>
<tr>
<td>females</td>
<td>12.3</td>
<td>14.7</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>15.7</td>
<td>-</td>
<td>16.9</td>
</tr>
</tbody>
</table>

Mean age in years at operation in the various groups (+ successful, - unsuccessful).

* Only one (1) patient.

operations even in such patients, and now we do not operate on patients below 12 years.

In our experience, secondary repair with bone graft has proved a safe and effective method for securing stable occlusion with improved lip appearance.

reprints: Dr. Karl-Erik Hogeman,
Department of Plastic Surgery,
University Hospital,
214 01 Malmö, Sweden
References


