SILICON ALLOPLASTIC GRAFTS IN MAXILLOFACIAL SURGERY

VIOREL IBRIC CIORANU, SORIN IBRIC CIORANU, SILVIU NICOLAE, VASILE NICOLAE

INTRODUCTION

Often, it is very difficult to reconstruct complex defects resulted from large ablation of malignant or benign tumours, severe trauma cases, or to correct bone and soft tissue growth pathology. Some times, the surgeon must choose from various techniques, the one with better prognosis. It is very important to use the proper material in TMJ ankylosis, to replace the lost disk. (1)

METHODS

The purpose of this study was to demonstrate the utility of silicon alloplastic grafts in correcting defects of the soft and hard tissues, but also as an interposing graft in the treatment of TMJ ankylosis to prevent relapse.

METHODS

In the past 10 years, we have used silicon material (block, sheets, prosthesis) (figure no. 1) to manage cases where there were soft or hard tissue defects: post surgical extirpation of large tumours, dealing with TMJ disorders or congenital facial defects (table no. 1). The first case shows a 58 year-old female patient, who had surgery for cheek carcinoma resulting in unaesthetic facial contour. 3 years from first surgery a malar bone silicon prosthesis was inserted intraorally, fixed with graft screws. The graft was trimmed into the desired shape after a careful clinical and CT examination. The next 2 cases involved a 26 year-old male patient, who underwent a mandibular resection for an aggressive ameloblastoma 12 years ago. There is a severe mandibular marginal contour defect. A silicon block is fixed in the remaining basal bone resulting in the correction of the defect (figure no. 2). The next 2 cases involved a 2 male patients, 47 and 31 years old, who suffered Le Fort II fracture of the middle face after car accident. The malar bones are retruded, thus resulting a serious facial asymmetry. 2 years ago. There is a severe mandibular marginal contour defect. A silicon block is fixed in the remaining basal bone resulting in the correction of the defect (figure no. 2). The next 2 cases involved 2 male patients, 47 and 31 years old, who suffered Le Fort II fracture of the middle face after car accident. The malar bones are retruded, thus resulting a serious facial asymmetry. 2 patients resulting in one-sided diplopia. The CT exams revealed improper orbital floor healing. Silicon sheets were inserted to reconstruct the orbital floor. This allowed for normal eye function. A 25 year-old patient who had undergone orthodontic treatment for maxillary hypoplasia intends to correct the facial contour, 2 malar bone silicon grafts are applied and screwed to the zygomatic. A 19 year-old male patient is diagnosed with left mandibular growth defect resulting in major facial asymmetry. After orthodontic treatment, a silicon block is shaped and fixed into place for the correction of the aesthetic deficiency.

METHODS

In the past 10 years, we have used silicon material (block, sheets, prosthesis) (figure no. 1) to manage cases where there were soft or hard tissue defects: post surgical extirpation of large tumours, dealing with TMJ disorders or congenital facial defects (table no. 1). The first case shows a 58 year-old female patient, who had surgery for cheek carcinoma resulting in unaesthetic facial contour. 3 years from first surgery a malar bone silicon prosthesis was inserted intraorally, fixed with graft screws. The graft was trimmed into the desired shape after a careful clinical and CT examination. The next 2 cases involved a 26 year-old male patient, who underwent a mandibular resection for an aggressive ameloblastoma 12 years ago. There is a severe mandibular marginal contour defect. A silicon block is fixed in the remaining basal bone resulting in the correction of the defect (figure no. 2). The next 2 cases involved 2 male patients, 47 and 31 years old, who suffered Le Fort II fracture of the middle face after car accident. The malar bones are retruded, thus resulting a serious facial asymmetry. 2 zygomatic silicon grafts are applied and screwed into the remaining bone, thus regaining the normal facial contour.

We used silicon grafts in the management of TMJ ankylosis in a group of 6 patients (2 females and 4 males) with good functional results. The cause of ankylosis was pediatric trauma in 5 patients and one patient suffered from recurrent ear infections as a child. In 5 patients, the disease affected one side, with only one case being bilateral. The opening of the mouth ranged from 2 to 6 mm, with a minimum in bilateral ankylosis. The chin appears rebounded, deviated towards the affected side, the pathological side of mandible looks shorter. The

Table no. 1. Personal cases divided by pathology and the use of the silicon graft

<table>
<thead>
<tr>
<th>16 PATIENTS</th>
<th>19 SILICON GRAFTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tumour excision</td>
<td>1 malignant – malar prosthesis</td>
</tr>
<tr>
<td>1 benign – shaped block</td>
<td></td>
</tr>
<tr>
<td>8 posttrauma sequelae</td>
<td>2 malar prosthesis</td>
</tr>
<tr>
<td>4 silicon sheets for obital reconstruction</td>
<td></td>
</tr>
<tr>
<td>3 hipoplasia</td>
<td>Bilateral Maxilla – 2 malar prosthesis</td>
</tr>
<tr>
<td>Mandibular unilateral growth disorder – 1 block</td>
<td></td>
</tr>
<tr>
<td>3 TMJ ankylosis</td>
<td>5 unilateral, 1 bilateral interposition graft</td>
</tr>
</tbody>
</table>

We used silicon grafts in the management of TMJ ankylosis in a group of 6 patients (2 females and 4 males) with good functional results. The cause of ankylosis was pediatric trauma in 5 patients and one patient suffered from recurrent ear infections as a child. In 5 patients, the disease affected one side, with only one case being bilateral. The opening of the mouth ranged from 2 to 6 mm, with a minimum in bilateral ankylosis. The chin appears rebounded, deviated towards the affected side, the pathological side of mandible looks shorter. The
interincisive line is deviated towards the affected side (figure no. 3).

**RESULTS**

The group of patients comprised of 16 cases for which 19 silicon grafts were used. The batch had a heterogeneous range of defect causes. 2 were the result of tumour extirpation (1 carcinoma and 1 one ameloblastoma). 6 patients had been previously involved in work or car related accidents that left them with bone sequelae in the middle face. 2 patients suffered from birth bone growth defects (one in the mandible and one in the maxilla). 6 patients had TMJ internal disorders: ankylosis. In 11 cases silicon was used as on onlay graft to correct facial contour. 8 cases involved the use of silicon as a bone prosthesis replacing the malar bone whose shape was trimmed after CT examinations.

**DISCUSSIONS**

Silicon was used as sheets (2-3 mm thick) when dealing with orbital floor improper posttraumatic bone healing.(6) In the surgical management of ankylosis, after bone resection, silicon sheets were used as interposition graft.(7) Orbital floor reconstruction did not pose a high surgical risk, but ankylosis treatment proved to be quite difficult. Nasal intubation was necessary in these cases often assisted by the bronchoscope. When the bone block develops towards the medial side, there is a high risk of damaging the maxillary artery, the meninx or the carotid artery.(8) There is also a risk of perforating the middle cranial fossa or damaging the acoustic nerve if the block extends towards the glenoid fossa or the petrous region of the temporal bone. In 2 cases, the silicon was used in block form, which allowed for easier handling and shaping intra-operatorily. All the grafts were fixed with special screws, beside the orbital floor grafts which did not require any fixation at all,(9) At follow-up, all the grafts looked well, not showing any signs of infections or resorbtion in early stages. The facial contour was regained leading to good symmetry.(10)

**CONCLUSIONS**

Silicon grafts in maxillofacial defects are widely used with good esthetic outcome in the correction of soft and hard tissue deficiencies and also as interposition grafts to replace the disk in ankylosis of TMJ. It is an optimal material due to its rapid integration, easy handling, the various forms of presentation and good prognosis.

**REFERENCES**