The results of opening wedge high tibial osteotomy using granular hydroxyapatite and beta-tricalcium phosphate bone substitute.

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Introduction

Open wedge high tibial osteotomy is a surgical technique mainly used in degenerative arthritis of the medial compartment. When the correction angle is more than 10 degrees, it is recommended to use bone graft material or synthetic material due to the possibility of non-union or delayed union. We analyzed the results of follow-up X-rays of a patient group using Frabone® as a bone substitute of open wedge high tibial osteotomy.

Picture 1. Imitate the Haversian & Volkmans’s canals, cylindrical, 7 holes, 2mm height, 2mm diameter

Material and Method

From February 2015 to December 2019, a total of 52 patients who underwent HTO with frabone graft were enrolled. Based on the A/P radiograph, the space from the lateral cortex of the osteotomy to the end of the medial was divided into 5 sections by 20%. A gap filling and correction angle were measured by the last A/P radiographs. The CT scan before removal of implant was used to determine bony union. Those who followed up for less than 6 months or received the distal femoral osteotomy at the same time were excluded.

Results

Of the 52 patients, 17 were male and 35 were female. Of these, 4 males and 7 females received both sides. 3 men and 2 women were excluded due to loss of follow up. A total of 57 cases were analyzed for 17 men and 40 women.

<table>
<thead>
<tr>
<th>Zone of gap filling</th>
<th>Mean correction angle</th>
<th>Mean correction gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>16.14 degrees</td>
<td>16.97mm</td>
</tr>
<tr>
<td>4</td>
<td>13.62 degrees</td>
<td>12.29mm</td>
</tr>
<tr>
<td>5</td>
<td>12.53 degrees</td>
<td>11.89mm</td>
</tr>
</tbody>
</table>

There was no nonunion or malunion, and there was one late infection.

Conclusion

According to the analyzed cases, a bony union could be obtained for relatively large angles or gaps. There are also very few complications, so it is recommended as a graft material that can fill the gap. Further studies are needed on bioabsorbability and bone integration.