



Successful hemicondylar femoral allograft for traumatic bone loss: A paediatric case study with ten years of follow-up



S. Hornstein, D. Moukoko, F. Deroussen, M.C. Plancq, L.M. Collet, R. Gouron*

Department of Pediatric Orthopedic Surgery, Amiens University Medical Center of Jules Verne University of Picardie, Amiens, France

ARTICLE INFO

Article history:

Received 15 May 2014

Received in revised form 10 September 2014

Accepted 28 October 2014

Keywords:

Massive allograft
Unicondylar allograft
Osteoarticular defect
Traumatic bone loss
Children

ABSTRACT

The management of massive traumatic defects of the knee joint is challenging, especially in children. Massive osteoarticular allograft may be an option in this kind of traumatic bone loss. We report on the case of a male patient who (at the age of 15) suffered an open grade III condylar femoral joint fracture, with a massive bone defect and a Schatzker V tibial plateau fracture. Ten years after first-line treatment with massive osteoarticular allograft of the lateral femoral condyle, the patient's knee was capable of full extension and 90° flexion. The patient reached a point of being pain free for nine years before he subsequently developed some pain with lateral arthritis progression.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

It has been reported that total osteoarticular allografts can successfully restore function after tumour resections [1]. Osteoarticular allografts are particularly useful in joint reconstruction. Hemicondylar allograft of the distal femur after tumour resection has a high success rate in both adults [2,3] and children [4]. Massive defects of the knee joint can equally be caused by trauma, and reconstruction can also be performed under such circumstances. To the best of our knowledge, there are few publications on massive osteoarticular allografts in the posttraumatic reconstruction of the distal femur [5,6]. Muscolo et al. have reported on the only two cases in children [7] but both allografts were second-line procedures performed about a year after the trauma.

Here, we report on the case of a paediatric patient in whom a large osteoarticular defect of the distal femur was treated with a first-line, massive, unicondylar frozen allograft.

2. Case report

A 15-year-old boy sustained an open, grade III condylar femoral joint fracture with a massive bone defect and a Schatzker V tibial plateau fracture in a motorcycle accident (Fig. 1). He was initially given emergency treatment, with minimal screw osteosynthesis of the tibia and use of an

external fixator to bridge the knee joint. The lateral collateral ligament was still inserted distally but had a proximal defect. The posterior cruciate ligament (PCL) was intact but the anterior cruciate ligament (ACL) was ruptured. There was no wound defect and soft tissues were easily closed. An electromyogram revealed sciatic neurapraxia. Two weeks later, the patient had no clinical or biological signs of infection and so we performed a reconstruction using a massive frozen osteoarticular allograft of the lateral femoral condyle (Fig. 2). We used a locking bone plate to provide fixation and performed a trans-bone suture of the lateral ligament (Fig. 3). The ACL was not rebuilt. The patient's post-operative course was uneventful.

The patient was allowed to place his full weight on the joint (using an articulated splint in full extension) after three months. The splint was removed at nine months after healing had been confirmed radiographically (Fig. 4).

At two years, neurological recovery was complete. The knee was pain-free and the left leg was two centimeters shorter than the right leg. A clinical examination revealed 90° of flexion (Fig. 5) and full, active extension. The knee displayed grade 2 laxity in the sagittal plane, grade 1 in valgus and a clinical valgus deformity (Fig. 6). However, the patient did not suffer from joint instability when walking unaided so he required neither ACL reconstruction nor a varus osteotomy. A radiographic assessment revealed 9° of valgus, narrowing of the lateral femorotibial joint space and full integration of the graft (i.e. with no radiolucency at the bone-graft interface).

Ten years after the allograft, the patient reported that his knee was still stable. He wore an orthopaedic insole to compensate for the difference in leg length. The patient walked with a slight limp but did not

* Corresponding author at: Service d'Orthopédie Pédiatrique, CHU d'Amiens, Hôpital Nord, Place Victor Pauchet, F-80054 Amiens Cedex 1, France. Tel.: +33 322 668 365; fax: +33 322 667 764.

E-mail address: richard.gouron@gmail.com (R. Gouron).



Fig. 1. Anteroposterior radiograph showing the initial fracture and the lateral hemicondylar defect.



Fig. 3. Postoperative radiograph after the hemicondylar allograft, with locking plate fixation.



Fig. 2. Massive hemicondylar allograft before implantation.

require a crutch. His only complaint was the emergence of pain around the lateral femorotibial joint. Knee Injury & Osteoarthritis Outcome Score (KOOS) score was 81.9. Although radiographic assessment showed that the width of the lateral femorotibial joint space had not changed (Fig. 7), MRI revealed the almost complete destruction of the lateral meniscus. Subsequent viscosupplementation significantly reduced pain levels. On the functional level, the Musculoskeletal Tumor Society Score (MSTS) score for the affected limb was 66.7%.

3. Discussion

Few cases of massive allografts for the reconstruction of post-traumatic bone defects have been reported. Only two such cases have been reported previously in a paediatric setting, and massive frozen allograft was only used as a second-line treatment after conventional osteosynthesis had failed [6,7]. In the present case, massive frozen allograft was used as first-line treatment for a bone defect of the knee joint.

In the present case, we chose the MSTS score to evaluate function because it has been validated for use in limb salvage procedures [8]. The MSTS score is also used in most studies of massive allograft reconstructions of the distal femur (including traumatic lesions).

In the literature, massive allograft is considered as a successful salvage procedure associated with excellent long-term outcomes. Dean et al. reported satisfactory results in 10 out of 14 cases of massive frozen elbow allograft after an average of seven and a half years of follow-up [9]. For the knee, Roffman reported on a 19-year-old patient who underwent joint allograft surgery for a traumatic bone defect of the lateral femoral condyle. The functional result was good [10]. Jaffe

Download English Version:

<https://daneshyari.com/en/article/6211413>

Download Persian Version:

<https://daneshyari.com/article/6211413>

[Daneshyari.com](https://daneshyari.com)