

A clinical case

# Treatment of a Large-Volume Simple Bone Cyst in the Distal Femur with Fibular Strut Autograft. A Case Report

[Kekec Halil](#)<sup>1\*</sup>, [Ergisi Yılmaz](#)<sup>2</sup>, [Ozdemir Erdi](#)<sup>3</sup>, [Tikman Mesut](#)<sup>4</sup>

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<sup>1</sup> Ardahan State Hospital, Ardahan, Turkey

<sup>2</sup> Karabuk Training and Research Hospital, Karabuk, Turkey

<sup>3</sup> Hacettepe University Faculty of Medicine, Ankara, Turkey

<sup>4</sup> Golbasi Sehit Ahmet Ozsoy State Hospital, Ankara, Turkey

\*E-mail: [drhalilkekec@gmail.com](mailto:drhalilkekec@gmail.com)

## Abstract

Simple bone cysts are the most common benign lytic bone tumors in childhood. In cases of large simple bone cysts, autografting may not be sufficient to fill the space. We report a case of a large-volume simple bone cysts in the distal femur successfully treated with curettage, fibular strut autograft and plate stabilization.

**Keywords:** simple bone cyst, distal femur, fibular strut autograft, curettage, plate stabilization.

## 1. Introduction

Simple bone cysts (SBC) are the most common benign, lytic bone tumors seen in childhood [1]. Large SBC carry a risk of pathological fractures. Curettage and grafting are the treatment methods used to prevent

pathological fractures. In cases of large SBC, autografting may not be sufficient to fill the space [2].

In this case report, we aimed to report the outcome of a patient with a large SBC in the distal femur treated with fibular strut autografting.

## 2. Clinical Case Description

17-year-old male patient presented to our orthopedic clinic with complaints of pain in his right knee without prior trauma. Radiological examinations revealed a lytic lesion measuring 71x35x46 mm in size, consistent with SBC, in the distal right femur (Figure 1).

The patient was positioned in a sterile supine position under spinal anesthesia. A 4 cm skin incision was made on the lateral aspect of the distal thigh using a minimally invasive plating technique. The skin layers were traversed with sharp dissection to reach the distal

femur. Fixation was achieved by creating stab incisions using a distal anatomic femur plate under fluoroscopy.

A 6 cm incision was then made on the anteromedial aspect of the distal femur. The cyst was opened, and the cyst contents were curetted. From the same side, 9 cm piece of the fibular shaft was harvested from the mid-segment of the fibula as a strut graft. The fibular autograft was inserted into the cyst, positioned parallel to the femoral shaft. A 4.5 mm cannulated screw was then placed into the cyst through a lateral

incision to provide drainage. The wound was closed in anatomical layers.



Figure 1 - Radiological examinations revealed a lytic lesion measuring 71x35x46 mm in size

An angle-adjustable knee brace was used to maintain range of motion. Quadriceps strengthening exercises were initiated on the first postoperative day, and the patient was mobilized with partial weightbearing. Weightbearing was allowed as tolerated

at the sixth week. No postoperative complications occurred. The sutures were removed after 2 weeks. Direct radiographs were obtained at the first, second, sixth months, and first-year follow-ups (Figure 2).



Figure 2 - One year after surgery

At the first year, the cyst was filled with bone tissue, and the fibular strut autograft had fully integrated into the femoral metaphysis. The patient had

full range of motion in the knee and ankle joints. No donor site morbidity was observed.

### 3. Discussion

SBC can lead to a pathological fracture of the distal femur. Surgery following a pathological fracture can increase patient morbidity.

Therefore, curettage, grafting, and plate fixation are recommended for weight-bearing areas of SBC, such as the distal femur.

Fibular strut autograft can be used in cases with large volumes.

In our case, a large-volume SBC in the distal femur was successfully treated with curettage, fibular strut autograft, and plate stabilization.

#### 4. Conclusions

Large-sized simple bone cysts in weight-bearing areas may lead to fractures. Surgery following a pathological fracture can increase patient morbidity. Fibula strut autograft and plate fixation is a good option

to fill the space and support the bone in large volume cysts.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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### Жамбас сүйегінің дистальді бөліміндегі ірі көлемді қарапайым сүйек кистасын фибулярлық аутотрансплантат арқылы емдеу: Клиникалық жағдай

[Kekec Halil](#)<sup>1\*</sup>, [Ergisi Yılmaz](#)<sup>2</sup>, [Ozdemir Erdi](#)<sup>3</sup>, [Tikman Mesut](#)<sup>4</sup>

<sup>1</sup> Ардахан мемлекеттік ауруханасы, Ардахан, Түркия

<sup>2</sup> Қарабүк оқу-зерттеу ауруханасы, Қарабүк, Түркия

<sup>3</sup> Хаджеттепе университеті, Медицина факультеті, Анкара, Түркия

<sup>4</sup> Шехит Ахмет Озсой мемлекеттік ауруханасы, Гельбашы, Анкара, Түркия

#### Түйіндемe

Қарапайым сүйек кисталары балалардағы сүйектің ең жиі кездесетін қатерсіз литикалық ісіктері болып табылады. Ірі көлемді сүйек кисталары жағдайында аутотрансплантация сүйек ақауын толтыру үшін жеткіліксіз болуы мүмкін. Бұл клиникалық жағдайда жамбас сүйегінің дистальді бөліміндегі ірі қарапайым сүйек кистасын кюретаж, фибулярлық аутотрансплантат және пластинамен тұрақтандыру әдістерін қолдану арқылы сәтті емдеу сипатталған.

**Түйін сөздер:** қарапайым сүйек кистасы, жамбас сүйегінің дистальді бөлімі, фибулярлық аутотрансплантат, кюретаж, пластинамен тұрақтандыру.

### Лечение простой костной кисты большого объема в дистальном отделе бедренной кости с помощью фибулярного аутотрансплантата: Клинический случай

[Kekec Halil](#)<sup>1\*</sup>, [Ergisi Yılmaz](#)<sup>2</sup>, [Ozdemir Erdi](#)<sup>3</sup>, [Tikman Mesut](#)<sup>4</sup>

<sup>1</sup> Государственная больница Ардахан, Ардахан, Турция

<sup>2</sup> Учебно-исследовательская больница, Карабюк, Турция

<sup>3</sup> Медицинский факультет Хаджеттепского университета, Анкара, Турция

<sup>4</sup> Государственная больница имени Шехита Ахмета Озоя, Гельбашы, Анкара, Турция

## **Резюме**

Простые костные кисты являются наиболее распространёнными доброкачественными литическими опухолями костей у детей. В случаях крупных костных кист аутооттрансплантации может быть недостаточно для заполнения дефекта. В настоящем клиническом случае описано успешное лечение крупной простой костной кисты дистального отдела бедренной кости с применением кюретажа, фибулярного аутооттрансплантата и стабилизации пластиной.

**Ключевые слова:** простая костная киста, дистальный отдел бедренной кости, фибулярный аутооттрансплантат, кюретаж, стабилизация пластиной.