CARDIOLOGIE TUNISIENNE

CASE REPORT

Arterial invasion of recurrent femoral chondro-sarcoma

Envahissement artériel d'un chondrosarcome fémoral récidivant

Faten Dhouib[1], Hèla Ben Jmaà[2], Hafedh Daly[2], Mohamed Ben Jmaà[3], Anis Chaâbouni[3], Hédi Chaabouni[4], Med Ali Rekik[4], Wafa Elleuch[5], Aicha Hsan[6], Kamel Ayadi[4], Moez Trigui[3], Imed Frikha[2].

1 *Department of cardio vascular surgery University Military Hospital, Sfax, Tunisia.*
2 *Department of cardiovascular surgery Habib Bourguiba Hospital, Sfax Tunisia.*
3 *Department of Orthopedic Surgery, Sfax University Military Hospital, Sfax, Tunisia.*
4 *Department of Orthopedic Surgery, Sfax Habib Bourguiba Hospital, Sfax, Tunisia.*
5 *Department of Physical Medicine and Rehabilitation, Sfax University Military Hospital, Sfax, Tunisia.*
6 *Department of Infectious Diseases, Sfax University Military Hospital, Sfax, Tunisia.*

Résumé

Le chondrosarcome est la deuxième tumeur osseuse maligne primitive la plus fréquente. La récidive locale avec envahissement vasculaire représente un défi thérapeutique exceptionnel. Nous rapportons le cas d'une femme de 65 ans présentant une récidive de chondrosarcome fémoral avec envahissement de l'artère fémorale superficielle, ayant nécessité une reconstruction vasculaire par greffe de veine saphène pour préserver le membre. Malgré une résection complète, une récidive précoce à 3 mois a conduit à envisager une amputation, que la patiente a refusée, préférant une radiothérapie palliative.

Ce cas illustre l'importance d'une prise en charge multidisciplinaire et les limites de la chirurgie conservatrice dans les cas d'atteinte des structures nobles.

Mots-clés

Chondrosarcome, récidive, artère fémorale superficielle, reconstruction vasculaire, sauvetage de membre

Summary

Chondrosarcoma is the second most common primary malignant bone tumor. Local recurrence with vascular invasion is an exceptional therapeutic challenge. We report the case of a 65-year-old woman with recurrent femoral chondrosarcoma involving the superficial femoral artery, requiring vascular reconstruction with saphenous vein graft for limb preservation. Despite complete resection, an early recurrence at 3 months led to indication of amputation, which the patient refused, receiving palliative radiotherapy instead.

This case illustrates the importance of multidisciplinary management and the limitations of limb-sparing surgery in cases involving noble structures.

Keywords

Chondrosarcoma, recurrence, superficial femoral artery, vascular reconstruction, limb salvage.

Correspondance

Ben Jmaà Hèla

Department of cardio-vascular surgery Habib Bourguiba Hospital Sfax, Tunisia

Email: benjemaa_hela@medecinesfax.org

INTRODUCTION

Chondrosarcoma constitutes the second most frequent primary malignant bone tumor, accounting for approximately 20-25% of all primary bone sarcomas (1). These tumors arise from cartilage-forming mesenchymal cells and predominantly affect the metaphyseal and diaphyseal regions of long bones, with the femur representing one of the most common anatomical sites (2). The incidence peaks in the fourth to sixth decades of life, with a slight male predominance (3).

The clinical management of chondrosarcoma remains challenging due to its relative resistance to conventional chemotherapy and radiotherapy (4). Complete surgical excision with wide margins represents the primary therapeutic modality (5).

Local recurrence of chondrosarcoma presents significant therapeutic dilemmas, particularly when involving critical anatomical structures (6). The involvement of major vascular structures, such as the superficial femoral artery, is exceptional and requires multi-disciplinary expertise (7).

Contemporary literature demonstrates varying approaches to managing chondrosarcoma recurrences, and the feasibility of achieving complete resection (8). The development of sophisticated imaging modalities and advances in reconstructive techniques have expanded the possibilities for limb-salvage procedures (9).

This case report describes the complex management of a femoral chondrosarcoma recurrence with superficial femoral artery involvement, necessitating vascular reconstruction to achieve limb preservation while maintaining oncological principles.

CASE REPORT

A 65-year-old female patient with diabetes, hypertension, and dyslipidemia underwent surgery in January 2025 for femoral chondrosarcoma treated with total hip replacement (THR). She was readmitted in December 2025 for the appearance of a tumefaction at the lower extremity of the femur.

CT scan of the knee revealed two suspicious masses suggestive of tumor recurrence: a deep mass within the lower part of the adductor magnus muscle measuring 11.3×6×3.8 cm with ill-defined margins, and a second well-defined, largely necrotic mass in the anteromedial aspect of the lower third of the thigh measuring 38×34 mm, in contact with the cutaneous plane and superficial fascia of the vastus medialis (Figure 1).

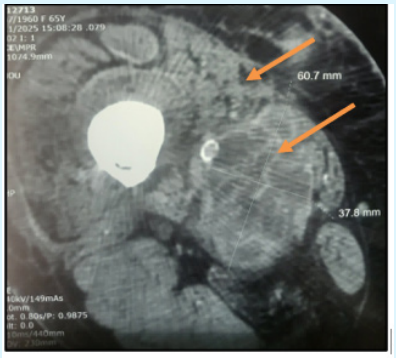

Figure 1. CT scan of the knee showing two suspicious masses: deep mass in adductor magnus muscle measuring 11.3×6×3.8 cm with ill-defined margins, with contact with the superficial femoral artery (arrows).

Thoraco-abdomino-pelvic CT scan showed no evidence of distant metastases.

MRI demonstrated a solid mass in the right muscular compartment measuring 64×41 mm in the axial plane and extending over 79 mm in height, showing hyper-intense T2 signal with moderate and heterogeneous enhancement after gadolinium injection, continuous with a second subcutaneous mass on the anteromedial aspect of the lower third of the thigh measuring 37 mm with similar characteristics. This mass was in contact with the superficial femoral artery (Figure 2).

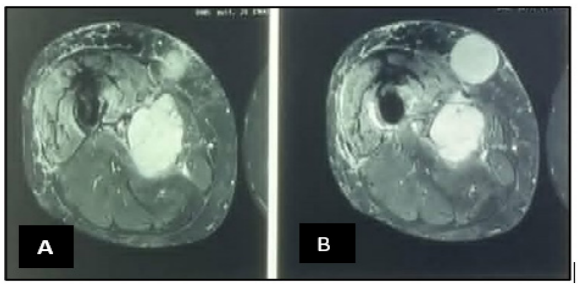

Figure 2. A: MRI showing solid mass in right muscular compartment with hyper-intense T2 signal and heterogeneous enhancement, in contact with superficial femoral artery.

B: Subcutaneous mass on the anteromedial aspect of the lower third of the thigh measuring 37 mm.

Biopsy of the superficial mass confirmed chondrosarcoma recurrence. The patient underwent surgery in collaboration with the orthopedic team. Resection of the mass was performed; the deep mass encased the superficial femoral artery, which was controlled, followed by end-to-end bypass using reversed saphenous vein. The superficial femoral vein was free (Figure 3).

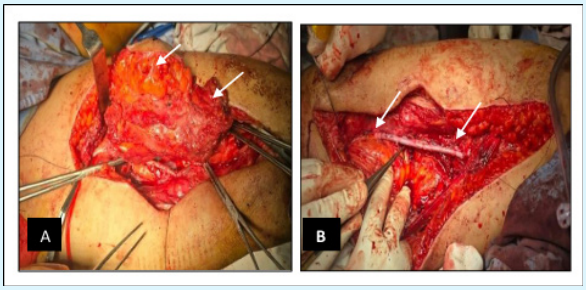

Figure 3: A: Intra-operative show of two masses of the tumor recurrence. B: Intra-operative view of superficial femoral artery reconstruction with reversed saphenous vein graft

The postoperative course was complicated by cutaneous substance loss with skin necrosis and superinfection. She underwent debridement and lavage followed by VAC therapy placement, which evolved well and the wound healed satisfactorily. Histopathological examination confirmed chondrosarcoma with complete tumor resection (R0).

However, the patient returned after 3 months for follow-up. MRI showed a focal osteolytic zone on the posterior aspect of the femoral stump extending over approximately 13 mm in length, associated with a surrounding soft tissue mass measuring 30×13 mm with contrast enhancement, suggestive of tumor recurrence.

Disarticulation was proposed to the patient, which she refused. She was therefore referred for palliative radiotherapy.

DISCUSSION

Chondrosarcoma recurrence patterns vary significantly based on anatomical location and tumor characteristics. Rougereau et al. (10) demonstrated that local recurrences of bone sarcomas around the knee occur in distinct patterns, with 57% presenting as distant nodules from noble structures with a mean recurrence delay of 15 months, while 38.5% recur in contact with noble structures (including vascular structures) with a longer mean delay of 42 months. Our case, with recurrence at 11 months involving the superficial femoral artery, represents an intermediate pattern suggesting aggressive behavior.

Albergo et al (11) studied femoral chondrosarcomas and reported an overall local recurrence rate of 27% in their series of 182 patients. Importantly, they found that pathological fractures significantly worsen prognosis, with 5-year disease-specific survival dropping to 49% in the fracture group compared to 75% in controls.

A recent study by Delgado et al (12) on vascular reconstruction in extremity soft tissue sarcomas showed a limb salvage rate of 89% with 5-year overall survival of 62%, although substantial perioperative complications persist (graft thrombosis 19%, wound complications 29%).

The aggressive recurrence pattern in our case warrants consideration of dedifferentiated chondrosarcoma. Anract et al (13) described dedifferentiated chondrosarcomas as representing 10% of all chondrosarcomas, characterized by extremely poor prognosis with mean survival of only 9 months. These tumors frequently demonstrate extensive soft tissue invasion and early metastatic spread.

A recent case series by Gusho et al. (14) on 16 patients with dedifferentiated chondrosarcoma confirmed this poor prognosis, with median survival of 46 months and 5-year survival probability of only 32.1%. The femur was the most common site (50% of cases), and 93.8% of patients presented with disease recurrence.

Alternative aggressive variants include mesenchymal chondrosarcoma, as reported by Hannachi-Sassi et al (15) in a 25-year-old woman. Their case demonstrated rapid progression with local recurrence in the popliteal fossa and pulmonary metastasis, ultimately developing scalp metastases.

Chondrosarcoma location significantly influences surgical approach and outcomes. Benzagmout et al (16) reported on cranio-facial chondrosarcoma, emphasizing the diagnostic challenges and necessity for complete surgical resection. Volpi and Poitout (17) described pelvic chondrosarcoma management using massive cryopreserved allografts in 21 patients, achieving stable long-term results.

Guelzim & El Bardouni (18) reported secondary chondrosarcoma of the distal fibula, requiring wide surgical resection with tibio-talar arthrodesis to address ankle instability, illustrating how anatomical constraints often necessitate functional sacrifices for oncological adequacy.

Extraskeletal chondrosarcomas present additional diagnostic and therapeutic challenges. Sasbou et al (19) reported myxoid extraskeletal chondrosarcoma of the thigh in a 28-year-old woman, treated with wide resection and adjuvant chemotherapy, with no recurrence at follow-up. This contrasts with our case's aggressive recurrence pattern, suggesting different biological behavior between variants.

Surgical reconstruction following chondrosarcoma resection requires careful consideration of oncological and functional outcomes. Köhler & Kreicbergs (20)

reported an innovative approach using autoclaved bone reimplantation supplemented with allogeneic bone matrix for extensive femoral diaphyseal chondrosarcoma. Despite subsequent infection and sequestration, new bone formation occurred, and the patient achieved full weight-bearing at 6 years without tumor recurrence.

For specific vascular reconstruction, the great saphenous vein remains the graft of choice for arterial reconstructions in lower extremities, with better outcomes than synthetic grafts in small and medium-sized arteries (21).

Rougereau et al (10) proposed a classification system for sarcoma recurrences based on noble structure involvement: (1) recurrences associated with distant disease requiring palliative management; (2) recurrences contacting noble structures where amputation is recommended; (3) recurrences distant from noble structures where conservative surgery may be considered. Our case falls into the second category, with the subsequent rapid re-recurrence validating their recommendation for amputation.

While limb-sparing surgery with vascular reconstruction is possible, complications remain significant. The recent meta-analysis by Delgado et al (12) showed that despite a limb salvage rate of 89%, major complications include graft thrombosis (19%), wound complications (29%), and wound infection (22%). In the context of chondrosarcoma with early recurrence, these risks must be carefully weighed against oncological benefits.

Recent guidelines from ESMO emphasize that complete surgical resection with negative margins remains the cornerstone of chondrosarcoma management, with adjuvant therapies playing a limited role except in dedifferentiated variants (22).

Targeted therapy and immunotherapy represent emerging approaches for advanced chondrosarcoma. Stacchiotti et al (23) demonstrated that pan-growth factor inhibitor regimens showed modest activity in advanced disease. Freedman and Hirbe (24) reviewed current molecular targets including IDH1/2 mutations, which are present in 70-80% of conventional chondrosarcomas.

CONCLUSION

Femoral chondrosarcomas with vascular invasion represent exceptional therapeutic challenges requiring multidisciplinary expertise. While vascular reconstruction can enable limb-sparing R0 resection, the aggressive recurrence pattern observed validates literature recommendations for amputation in cases involving noble structures. The early re-recurrence emphasizes the importance of comprehensive patient counseling regarding prognosis and treatment options.

REFERENCES

1. Dun CAD, Neelachesan T, Saha S. Chondrosarcoma: A comprehensive review. Surg Oncol. 2023;42:101974.
2. Gusho CA, Lee L, Zavras A, Tandon A, Bird B, Wei L, et al. Dedifferentiated chondrosarcoma: A case series and review of the literature. Orthop Rev (Pavia). 2022 May 30;14(3):35448. doi: 10.52965/001c.35448. PMC9235431.
3. Mavrogenis AF, Ruggieri P, Mercuri M, Papagelopoulos PJ. Dedifferentiated chondrosarcoma revisited. J Surg Orthop Adv. 2011;20(2):106-111.
4. Canadian Cancer Society. Treatments for chondrosarcoma. 2024. Available from: https://cancer.ca/en/cancer-information/cancer-types/bone/treatment/chondrosarcoma
5. Mass General Hospital. Chondrosarcoma. 2024. Available from: https://www.massgeneral.org/orthopaedics/oncology/conditions-and-treatments/chondrosarcoma
6. Seyit Ali Gümüştaş P. CHONDROSARCOMA. 1999. Available from: https://www.seyitaligumustas.com/en/chondrosarcoma
7. Delgado LM, Pompeu BF, Macedo VS, Almeida JPM, de Paula FJ, Oga-Mizusaki IM, et al. Vascular reconstruction in extremity soft tissue sarcomas: A systematic review and single-arm meta-analysis. J Surg Oncol. 2026 Jan 8. doi: 10.1002/jso.70194.
8. Lahrach EM, Al Idrissi N. Surgical management and reconstruction of dedifferentiated chondrosarcoma in the proximal femur: A case report. Cureus. 2024 Jun 25;16(6):e64126. doi: 10.7759/cureus.264126.
9. Duke Health. Chondrosarcoma research discovers potential treatment pathways. 2025 Aug 4. Available from: https://physicians.dukehealth.org/articles/chondrosarcoma-research-discovers-potential-treatment-pathways
10. Rougereau G, Larousserie F, Anract P, Biau D. Prise en charge des récidives de sarcome sur prothèse massive de genou. Revue de Chirurgie Orthopédique et Traumatologique. 2022.
11. Albergo J, Gaston C, Jeys L, Khajuria A, Carter S, Tillman R, et al. Management and prognostic significance of pathological fractures through chondrosarcoma of the femur. Int Orthop. 2015 Nov;39(11):2243-2249. doi: 10.1007/s00264-015-2816-7.
12. Delgado LM, Pompeu BF, Macedo VS, Almeida JPM, de Paula FJ, Oga-Mizusaki IM, et al. Vascular reconstruction in extremity soft tissue sarcomas. J Surg Oncol. 2026. doi: 10.1002/jso.70194.
13. Anract P, Tomeno B, Forest M. Chondrosarcomes dédifférenciés: étude de treize cas cliniques et revue de la littérature. Rev Chir Orthop Reparatrice Appar Mot. 1994;80(8):669-680.
14. Gusho CA, Lee L, Zavras A, Tandon A, Bird B, Wei L, et al. Dedifferentiated chondrosarcoma: A case series and review of the literature. Orthop Rev (Pavia). 2022;14(3):35448. doi: 10.52965/001c.35448.
15. Hannachi-Sassi S, Mekni A, Sassi B, Mrad K, Ben romdhane K. Extraskeletal mesenchymal chondrosarcoma: a case report and

review of the literature. Revue de chirurgie orthopédique et réparatrice de l'appareil moteur. 2004;90(3):271-275.

16. Benzagmout M, Oulali N, Hachimi H, Chakour K, Alami M, Chaoui F. Le chondrosarcome crânio-facial: Etude d'un cas et revue de la littérature. J Méd Chir Fac. 2007.
17. Volpi R, Poitout D. Chondrosarcome du bassin: technique opératoire et résultats. J Orthop Surg. 2005;13(2):156-162.
18. Guelzim S, El Bardouni A. Chondrosarcome secondaire à localisation fibulaire rare: à propos d'une observation. Pan Afr Med J. 2015;22:292. doi: 10.11604/pamj.2015.22.292.7843.
19. Sasbou Y, Rhanim A, Mhammdi Y, Nkaoui M, El Bardouni A, Berrada MS, et al. Chondrosarcome myxoïde extra-osseux: à propos d'un cas et revue de la littérature. Pan Afr Med J. 2015;20:447. doi: 10.11604/pamj.2015.20.447.6583.
20. Köhler P, Kreicbergs A. Chondrosarcoma treated by reimplantation of resected bone after autoclaving and supplementation with allogeneic bone matrix. A case report. Clin Orthop Relat Res. 1993 Sep;(294):242-247.
21. Medscape. Chondrosarcoma: Practice Essentials, Pathophysiology, Epidemiology. 2024 Aug 28. Available from: https://emedicine.medscape.com/article/1258236-overview
22. Hofer MEO. Bone sarcomas: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2014 Oct;25 Suppl 3:iii113-iii123. doi: 10.1093/annonc/mdu186.
23. Gelderblom H, Hogendoorn PC, Dijkstra SD, van Rijswijk CS, Krol AD, Taminiau AH, et al. The clinician's guide to soft tissue sarcomas. Nat Rev Clin Oncol. 2023 Jan;20(4):245-262. doi: 10.1038/s41571-023-00745-8.
24. Stacchiotti S, Grünwald V, Cassidy A, Walter A, Burgers S, Le Cesne A, et al. Targeted therapy in chondrosarcoma: A systematic review. Eur J Cancer. 2022 Mar;165:142-156. doi: 10.1016/j.ejca.2022.01.012.
25. Freedman BN, Hirbe AC. Chondrosarcoma: Current concepts and treatment. Curr Treat Options Oncol. 2023 Jun;24(6):728-745. doi: 10.1007/s11864-023-01069-2.