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# Tibialization of the fibula after medio-diaphyseal tibial tumor excision, about a case at the university teaching hospital of cocody in Abidjan

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**Abstract**
We report the case of a 29-year-old man with an adamantinoma of the right tibia. A medio-tibial carcinological excision was performed. Filling the bone defect was not possible. Fibular tibialization was preferred instead, through a double inter-tibio-fibular graft placed upstream and downstream of the defect. An osteosynthesis of the tibia was performed using a screwed plate. The evolution was satisfactory with fibular hypertrophy after one year. Walking and joint ranges of motion were normal and painless. Large tibial bone defects severely compromise the functional prognosis of the limb. In tumor surgery, amputations are now replaced by limb-saving interventions using various techniques. The inter-tibio-fibular graft stands out among them. This method is an important option in developing countries where technical and human resources are limited.

**Keywords:** Tibial bone defect, fibular tibialization, adamantinoma

## Introduction
Bone substance loss is a common complication in orthopedic traumatology, often resulting from high-energy trauma or bone infections. Bone defects can also be a consequence of tumor resections. They present the challenge of filling the bone defect and saving the limb. Many techniques are described depending on the extent of the bone loss and the availability of substitute bone. Among them are the Masquelet induced membrane technique [1], Ilizarov osteogenesis [2] technique, or the inter-tibio-fibular graft (ITFG) [1, 3, 4]. In cases of significant bone substance loss, fibular tibialization is also considered. Several techniques of tibialization are described, including medialization of the ipsilateral fibula [5-7], double ITFG [8, 9], or vascularized contralateral fibula transfer [10]. The authors highlight the results of a double ITFG, following a carcinological bone resection, in a young adult, within a context of limited human and technical resources.

## Case report
A 29-year-old man, agricultural worker, consulted for a painless hard mass on the right tibia, evolving for more than 3 months (fig.1). The progression was gradual, located on the antero-medial side of the tibia. He had no medical history except for repeated micro-traumas to the tibia from the pedals of his motorcycle.
The clinical examination revealed a good general condition. On the leg, there was a hard, regular, fixed mass with shiny skin and a scar related to a biopsy. There were no signs of lymphangitis or satellite lymphadenopathy.
The radiological assessment revealed a lytic bone mass with regular, homogeneous borders, blowing out the antero-medial cortical bone, with no invasion of the soft tissues (Fig.1). A biopsy had been performed at another hospital, diagnosing an adamantinoma of the tibia.
A total carcinological tumor excision was performed (Fig.1). The patient was positioned in the dorsal decubitus position with a bolster under both buttocks. The approach was anterior, from the tibia to the tibiofibular space. The bone resection resulted in a significant bone defect of 18 cm. After freshening the tibial and fibular cortices, a double inter-tibio-fibular graft (ITFG) by encasement was performed upstream and downstream of the bone defect (Fig. 3). The two cortico-spongious grafts were harvested from both iliac crests. The two tibial segments were stabilized by a long, compressive, screwed plate (Fig. 3). There was no filling in the bone defect site. Closure was performed with a drain in place.

The leg was immobilized in a posterior plaster splint for 60 days. The dressings were done until the wound healed. The patient was off weight-bearing for 90 days. A physiotherapy regimen focusing on knee and ankle range of motion and muscle strength was done.

After 90 days, he gradually started bearing weight. Full weight-bearing was achieved around the 150th day. Radiographic images were taken at day 90 (fig. 3), day 180, and then 2 years later (fig. 4).

We observed the consolidation of the synostoses and fibular hypertrophy, with the fibula doubling its initial volume.

There was no local tumor recurrence, and walking was normal 3 years later. Furthermore, the second pathological examination confirmed the initial diagnosis of tibial adamantinoma. The patient is being followed up in oncology for chemotherapy.

**Fig 1:** Tumorous bone mass in the tibial diaphysis of a patient. X-ray showing tibial osteolysis with clear margins, cortical blowout, without soft tissue invasion. Carcinological excision. Tibial bone substance loss of 18 cm.

**Fig 2:** Proximal then distal inter-tibio-fibular graft. Tibial osteosynthesis using a bridging screwed plate. Closure with an aspirative drain.

**Fig 3:** Start of progressive weight-bearing. No tibial tumor recurrence in the patient after 90 days.

**Fig 4:** Tibialization at 3 years. Fibular hypertrophy after full weight-bearing. Fusion of the upper and lower tibio-fibular bony bridges. No local tumor recurrence. Good functional outcome

**Conflict of Interest**
Not available

**Financial Support**
Not available

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