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Pedicled and free fibula grafts in primary reconstructions of the tibia: which and when?

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BACKGROUND: The authors report their experience with vascularised fibula autograft (VFA), either free, or ipsilateral pedicled, in large tibia defects, analysing indications and results.

METHODS: From 1994, VFA was used for tibia defects in 50 patients (median age 14ys, range 8-38) with bone sarcomas. (44 cases with neoadjuvant chemotherapy, 3 with radiotherapy).

In two patients, VFA was implanted alone, in one autografts were added. In 47 cases, VFA was associated to MBA. All cases had synthesis with plates.

Defect ranged 9-22cm, involving the diaphysis in 27 cases. In 21 cases, the resection included a proximal intraepiphyseal osteotomy; in 2 patients involved a distal intraepiphyseal osteotomy.

In 24 cases contralateralVFA was harvested as free-flap and microanastomosis performed between fibular vessels and anterior-tibialis vessels of the recipient leg.

In 26 cases ipsilateralVFA, harvested through posterolateral approach opposite to medial approach used for resection, was transposed to fill the tibia defect, maintaining the vascularity.

Implant outcome was investigated on serial radiology in 45 cases with 12 months follow-up (f-up).

Function was evaluated according MSTs.

RESULTS: At median f-up of 83months, there are 42 disease-free survivors. Two patients died for toxicity and 6 of disease.

There were 5 local recurrence: three were amputated, one revised with megaprosthesis, one patient had local radiotherapy.

There were 2 infections (one in each group) necessitating implant removal: both were reconstructed (one megaprosthesis, one Ilizarov technique).

Mechanical complications (delayed union, fracture) occurred in 14 patients. Five healed without surgery. Nine patients were revised but only 2 (one in each group) had VFA removed and substituted with new grafts. These patients were the only ones with no changes in serial radiology.

Functional analysis showed 80% Excellent and Good results (78% in freeVFA and 82% in pedicledVFA).

DISCUSSION: Both free and pedicledVFA have 95% chance to maintain viability and mechanically adapt to tibia reconstructions. PedicledVFA should be the first choice in diaphyseal defects but it's also effective in proximal intraepiphyseal reconstructions. Previous radiotherapy, fractures or leg abnormalities may force to prefer freeVFA.

AssociationVFA/MBA: Serial radiological analysis demonstrates intense remodelling suggesting biological, efficient and durable reconstructions.

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