ORTHOPAEDIC ONCOLOGY · PATIENT GUIDE

Bone Graft or Metal Implant After Tumour Removal: How Is Reconstruction Chosen?

Patient guide | Orthopaedic oncology

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There is no single material that suits every gap left after bone tumour removal. A bone graft rebuilds the gap with bone that must join to the remaining skeleton. A metal segment provides structural support without that graft-healing step, but can develop mechanical or infection problems. Some operations combine the two. The choice begins with what needs removing and what useful function can be preserved, rather than whether bone or metal sounds more reassuring.[1][2]

After surgery: Sudden severe pain or inability to use the reconstructed leg needs urgent assessment. Read the action advice below.

First, what part of the bone needs replacing?

This article mainly compares reconstruction of a gap in the shaft of a long bone, with the neighbouring joints preserved. Surgeons call this an **intercalary reconstruction**. Replacing a segment that includes the joint surface is a different problem, covered in the megaprosthesis guide.[1]

The length and position of the gap, the bone available for fixation and the surrounding muscles and skin determine which choices are feasible. The tumour must still be removed with an appropriate margin, a surrounding boundary intended to avoid leaving tumour behind. Reconstruction is planned around that removal.[1][2]

What do the bone options involve?

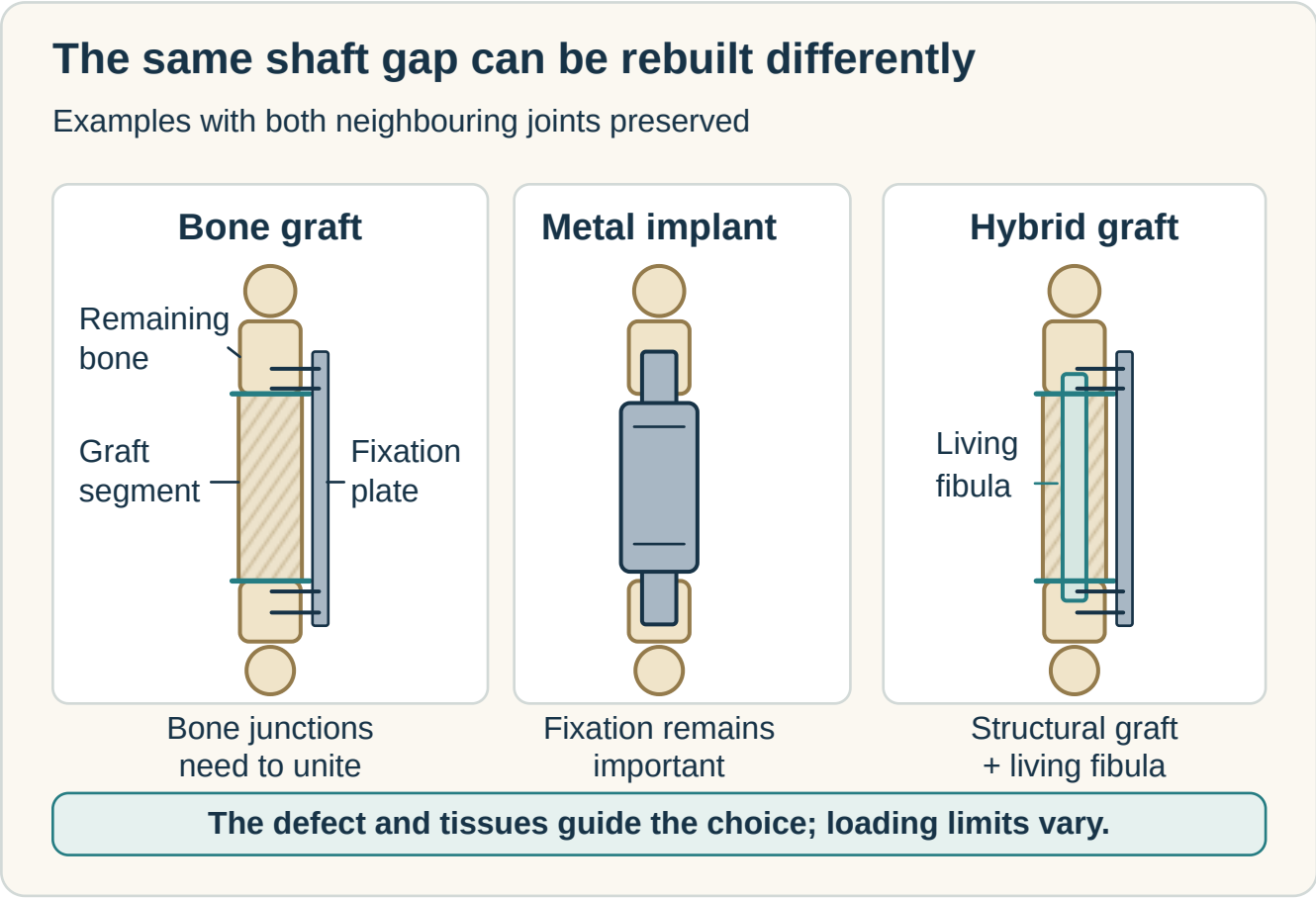
Autograft means bone from your own body; **allograft** means donor bone. A structural donor graft supplies a shaped piece of bone but has no surgically reconnected circulation of its own. It must join the remaining bone. A vascularised graft, such as a transferred fibula, carries a blood supply as well as bone.[2]

Some centres use the removed bone segment after a specialist process to destroy tumour cells before reimplantation. That processed bone also needs to heal into the reconstruction. This is a selected surgical technique, not simply putting untreated tumour-bearing bone back.[1][2]

A graft does not mean an operation without metal. Plates, screws or other fixation may hold it steady. In a combined reconstruction, a larger donor graft can provide structural bulk while a living fibular graft contributes bone with its own circulation.[2]

How do the main choices differ?

Swipe across the illustration to see all labels.



Each example keeps the neighbouring joints and remaining original bone. A graft may still need metal fixation; a hybrid adds living fibula. These are schematic shaft reconstructions, without a technique ranking or a loading timetable.[2]

Union means the graft and remaining bone have joined. If this does not happen, called nonunion, another procedure may be needed. A graft can also fracture or become infected. Metal avoids a graft-to-bone healing junction, but it is still attached to the remaining skeleton and can loosen or break. Neither choice removes the possibility of further surgery.[1][2]

Does metal mean walking sooner?

A segmental implant can allow earlier rehabilitation in suitable cases. It does not automatically permit immediate full weight-bearing. The way it is fixed, the remaining bone and any muscle or tendon repair still matter. A graft usually needs protection while its junctions heal and its strength develops.[1] [2]

For everyday planning, the useful information is how much weight the leg may take, or how much lifting an arm may do, and how that permission will change. Getting from bed to a chair may need a different plan from managing an upstairs bedroom or returning to a job that involves standing all day. These are points for the surgical and rehabilitation plan, not a timetable inferred from the material.

Which reconstruction is likely to last?

The evidence supports several workable approaches, with different ways of failing. It does not establish a material that lasts longest across all shaft defects. A choice may favour preserving joints and rebuilding bone, or favour structural support without waiting for graft union, depending on the actual defect and recovery priorities.[1][2]

A new persistent ache or change in function also deserves an earlier surgical review, particularly because graft or fixation problems can need treatment.[1][2]

More about the evidence: why there is no universal winner

The intercalary systematic review included varied diagnoses, bones, techniques and follow-up. A separate reconstruction review also included trauma and infection. Overlapping functional results do not prove that the procedures are equivalent.[1][2]

> ### Get urgent help for a sudden loss of function
>
> After leg reconstruction, sudden severe pain, deformity or inability to bear weight needs urgent assessment. Stop loading the leg and get help rather than testing it with more walking.[3]

A clear decision explains what each feasible reconstruction would leave you able to do, what must heal and what a later repair might involve. The recovery guide explains the broader planning around safe movement and support at home.

Frequently Asked Questions

Does a bone graft mean there is no metal?

No. Fixation and hybrid reconstructions may contain metal even when the main biological segment is bone.[1][2]

Is donor bone the same as a living vascularised graft?

No. Donor bone has to join the remaining bone. A living vascularised graft is transferred with blood vessels that are reconnected at the new site.[2]

Is one material always more durable?

There is no reliable universal winner. The location and size of the gap, remaining bone, soft tissues and expected demands matter more than the material name alone.[1][2]

> Your consultation

Discuss bone reconstruction in Kannur

A consultation with Dr. Vishnu Baburaj at Aster MIMS Kannur can help you understand the bone defect, feasible reconstruction choices and how each would affect healing and daily function.

Book a consultation Plan your visit
Preparing for your consultation

The evidence behind this article

1. Errani C et al. Intercalary reconstruction following resection of diaphyseal bone tumors: A systematic review. Journal of Clinical Orthopaedics and Trauma, 2021. Intercalary reconstruction review.
2. Migliorini F et al. Strategies for large bone defect reconstruction after trauma, infections or tumour excision: a comprehensive review of the literature. European Journal of Medical Research, 2021. Large bone-defect reconstruction review.
3. NHS. Broken leg. Reviewed June 2025. NHS guide to a broken leg.

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This article is for educational purposes and does not replace a medical consultation.