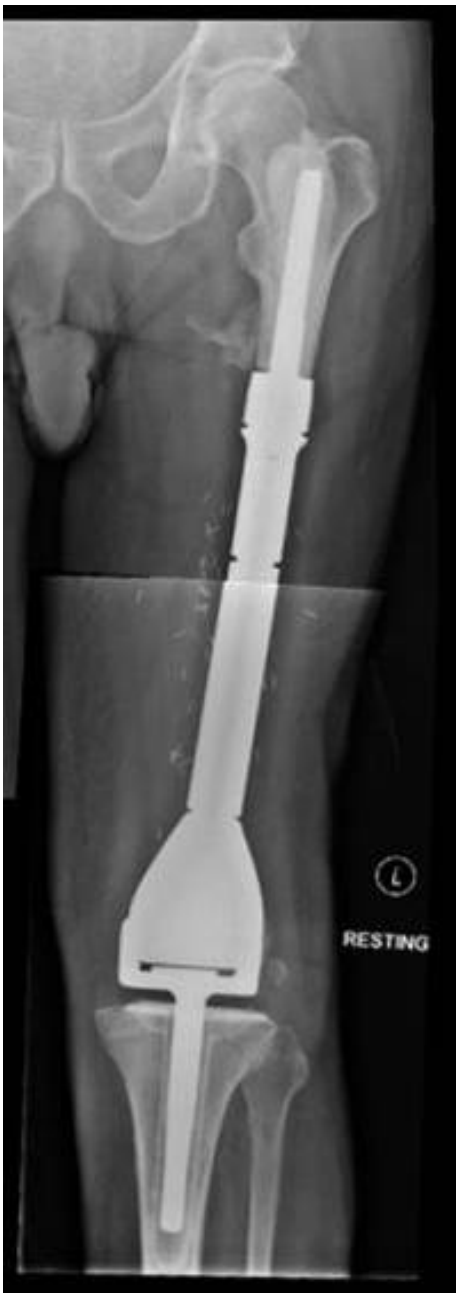
North of England Bone and Soft Tissue Tumour Service

Guidelines for rehabilitation after replacement of the distal femur



Distal femoral replacement surgery is usually carried out as part of treatment for a tumour involving the distal femur. This surgery is complex and treatment varies according to the needs of the individual.

Many patients also undergo chemotherapy and occasionally radiotherapy treatment which can interfere with rehabilitation.

The aim of this document is to provide some information about distal femoral replacement to guide rehabilitation.

The needs of patients vary and the application of these guidelines to the treatment of individual patients should be discussed with the clinical team.

What is Distal Femoral Replacement?

Distal femoral replacement is a procedure in which the distal femur and often the surrounding soft tissues are removed, usually as part of treatment for a primary bone tumour such as osteosarcoma or a secondary bone tumour, such as metastatic breast cancer. Some patients may have replacement of the distal femur as treatment for failed knee replacement or fracture. The anatomical structures which are removed include a variable amount of the bone itself, and the surrounding muscles along with the knee joint. The aim of the surgery is to spare the limb and restore mobility and function.

The bone is usually reconstructed with a cemented custom or modular implant which includes a fully constrained rotating hinge knee replacement. Some children may receive an implant which can be lengthened as they grow. Some implants may be silver coated to reduce the risk of infection. Most designs incorporate some hyperextension of the knee to allow standing in full extension despite weak quadriceps.

This surgery is complex and there are risks. Recognised complications include:

- Deep infection
- Weakness of the leg usually as a result of muscle resection
- Thrombosis or embolism
- Local recurrence of the tumour
- Loosening of the implant
- Patello-femoral pain/maltracking
- Loss of ROM

Expected outcome:

- Can take a year or more to achieve optimal function
- Extensor weakness and muscle loss is common
- Independently mobile usually without walking aids
- ROM at knee 0 to 110 degrees
- Self caring
- Return to non-impact sports if appropriate

Muscles affected:

- Quadriceps (often a significant volume is resected) and hamstrings. Gastrocnemius usually detached from femoral insertion. Hamstring muscle transfers often performed to support quadriceps.

Rehabilitation schedule

The following is a guide to treatment only. This regime should be tailored according to the individual needs of the patient through discussion with the clinical team. In particular, many patients have chemotherapy after treatment which has a major impact on their ability to rehabilitate.

Time period	Goals	Intervention
0-5 days	• Optimise tissue healing • Ensure pain control • Avoid swelling • Care for pressure areas • Protect quadriceps repair/muscle transfer if performed • Regain quadriceps control • Avoid respiratory complications	• Breathing exercises and pressure care • Out of bed once drains removed • Keep limb elevated • Begin isometric exercises • Begin knee flexion after 48 hours if limb settled and no contraindication • Protected weight bearing • Consider brace if no quads control or flexion to be avoided
1-6 weeks	• Increase mobility • Increase flexion of knee • Return to normal living	• Wound monitoring with check at 2 weeks • Fully weight bearing as tolerated if good quadriceps control • Active ROM exercises • OT input around return to driving, self care • Ensure continuing physiotherapy after discharge
6-12 weeks	• Increase mobility • Increase quads strength • Increase ROM • Return to normal living	• Maintain ROM at hip and ankle • Wean from walking aids • Quadriceps strengthening • Active ROM exercises • OT input around return to driving, self care, avoiding dislocation • Ensure continuing physiotherapy • Core stability
>12 weeks	• Consolidate and improve strength • Wean from brace if used • Establish normal gait • Establish independence	• Wean from brace • Wean from walking aids if feasible • Ensure even weight bearing • Balance and proprioception • Core stability • OT input as appropriate

Occupational Therapy Intervention

Occupational therapy intervention is important in assisting return to independence. Further referral may be appropriate for any specific OT related problems that the patient may be experiencing. These may include activities of daily living such as washing, dressing, bathing, transfers, equipment provision, environmental assessment and anxiety and relaxation.

The impact of cancer and adjuvant treatments on rehabilitation

A diagnosis of cancer and the treatment that follows have major impacts on many aspects of the lives of patients and their families. Although physical functioning is an important aspect of the survivorship experience for patients with sarcoma, others include psychological health, and the impact on employment and relationships. Anxiety and depression can have a major impact on rehabilitation – the setting of achievable goals may be helpful in increasing the feeling of control experienced by patients. Physical rehabilitation after a surgical procedure is just one aspect of maximising outcomes for these patients.

Chemotherapy

Multiagent chemotherapy routinely leads to bone marrow toxicity. White cell counts are at their lowest 10-14 days after a cycle of treatment, at which point the patient is at risk of infection. Contact with other patients, particularly those with infections and hydrotherapy should be avoided at this point.

Chemotherapy may lead to nausea, vomiting, diarrhoea, loss of appetite, fatigue, lethargy and reduced exercise tolerance. Many patients find it difficult to rehabilitate during chemotherapy treatment

Radiotherapy

In the short term, radiotherapy leads to redness, soreness and sensitivity of the skin. In the longer term, radiotherapy can lead to fibrosis of soft tissues and loss of movement which can progress for up to two years or more. Physiotherapy during and after radiotherapy treatment may help to prevent this. Heat treatments are contraindicated after radiotherapy. Application of lotions and manual treatments are contraindicated during radiotherapy, but can be used with caution afterwards. Electrical treatment modalities can be used with caution.

In the longer term, radiotherapy can lead to weakness of the bone and is associated with a risk of fracture. Lymphoedema is a common side effect of treatment.

Sources and further reading

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