ORTHOPAEDIC ONCOLOGY · PATIENT GUIDE

Radiotherapy for Soft Tissue Sarcoma: Before or After Surgery?

How the team weighs wound healing, later side effects and the surgical plan.

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When an adult needs both surgery and radiotherapy for a localised soft tissue sarcoma of an arm, leg or superficial trunk, radiotherapy is often recommended first. The decision balances wound healing after surgery against longer-term treatment effects.[1]

A recommendation for radiotherapy can raise an immediate question: why is surgery not enough? The answer starts with what each treatment is intended to do, before deciding which comes first.

First, does this tumour need radiotherapy?

Radiotherapy is added when the risk of cancer returning in the treated area justifies it. The team considers the pathology, size and location, as well as the surgical margins expected or achieved. Some patients with a low local recurrence risk can have surgery without radiotherapy.[1]

External beam radiotherapy directs radiation from a machine to a defined part of the body. It is a local treatment, rather than treatment of the whole body.[4]

For selected sarcomas, surgery removes the tumour and radiotherapy reduces the risk of cancer returning in that area. Being offered both does not, by itself, mean an operation has failed. Radiotherapy can be part of the plan from the outset.[6]

> **Dr. Vishnu's perspective**
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> Before we settle the order of treatment, I want you to understand why radiotherapy is being recommended in your case. We should talk through concerns about the wound and later movement with the radiation oncologist, then explain why this sequence suits the proposed operation. The appointment dates should make sense as parts of one plan, with time for your questions.

Why treatment before surgery is often preferred

Before surgery, the tumour remains visible for treatment planning. Radiation can generally be directed to a smaller treatment volume, using a lower total dose than postoperative treatment. Reducing exposure of surrounding tissues is intended to limit later problems such as fibrosis, swelling and joint stiffness. Fibrosis means tissue thickening and scarring.[2]

The trade-off is wound healing. In the randomised Canadian trial that compared the two sequences, major wound complications were more frequent after preoperative radiotherapy. These were substantial problems, including wounds requiring another operation or invasive wound care. Tumour size and location also influenced risk.[3]

More about the evidence

The randomised Canadian trial compared complete treatment approaches with different radiation doses and treatment areas. It did not simply move an identical course from one side of surgery to the other. The findings describe those treatment approaches and cannot give an exact personal forecast for treatment today.[3]

The planning discussion needs to cover both parts of recovery: wound healing after the operation and possible effects on the limb months or years later. It should explain how those concerns influenced the recommended sequence.

When radiotherapy after surgery may be appropriate

Postoperative treatment may be preferred when the wound-healing risk outweighs the concern about late effects. It may also be recommended when examination of the removed tumour reveals adverse features that were not anticipated before surgery.[1]

After surgery, the complete specimen provides more information about the tumour and margins. However, postoperative radiation usually covers a larger area, and delayed wound healing can postpone its start. The surgeon and radiation oncologist need to coordinate the plan.[2]

The reason for postoperative treatment should be clear in your plan: was it chosen because of wound concerns, or did the surgical specimen reveal something new? The same plan should identify who checks that you are ready to begin.

What the planning appointment involves

A planning session, often called a simulation, uses imaging to define the treatment area. You are positioned carefully and may have a support mould or skin marks to help reproduce that position during treatment.[4]

During a treatment session, staff operate the machine from outside the room but can watch and speak with you. You do not feel the radiation beam itself. Tell them if you are uncomfortable; treatment can be stopped when necessary.[4]

Travel, time away from work and help at home belong in the planning discussion. The surgical and radiotherapy teams should provide a coordinated schedule, including the planned number of visits, so you can see what it means for everyday life.

Discuss side effects before treatment starts

Radiation can affect healthy cells near the treatment area. Fatigue is common, while other side effects depend on the body part treated. Ask which effects are most relevant to the proposed field, rather than assuming that another person's experience will be the same as yours.[5]

Some effects settle after treatment, while others persist or appear later. The treated area, other cancer treatments and individual factors influence late effects.[5]

Before treatment begins, the written plan should cover wound checks, follow-up after both treatments and whom to contact about a new problem.

Frequently Asked Questions

Does every soft tissue sarcoma need radiotherapy?

No. Patients at low risk of local recurrence may have surgery alone. The decision depends on the tumour and the expected or achieved surgical margins. [1]

Does radiotherapy before surgery make wound problems more likely?

The randomised timing trial found more major wound complications with preoperative treatment. The tumour site and size also mattered, so the result cannot predict one patient's outcome. [3]

Does the tumour have to shrink for radiotherapy to have worked?

No. A soft tissue sarcoma may not become visibly smaller during preoperative radiotherapy. Lack of shrinkage alone does not establish that treatment was ineffective. [2]

Will I be radioactive after external beam radiotherapy?

No. External beam radiotherapy does not make you radioactive. You can be around other people, including children and pregnant women. [4]

> Your consultation
>
> ## Discuss the order of sarcoma treatment
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> To discuss how surgery fits with proposed radiotherapy, you can book a consultation with Dr. Vishnu Baburaj at Aster MIMS Kannur.
>
> > Book a consultation Plan your visit

The evidence behind this article

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5. National Cancer Institute. *Radiation Therapy Side Effects.* Reviewed 15 May 2025. Side effects and late effects.
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