TITLE:

Radiotherapy for Tendinopathy?!

BODY TEXT:

Usain Bolt is arguably the best runner in history, and he's also had the best medical care for his various sports injuries.

As the recent Netflix documentary *Bolt* showed, he had very low dose radiotherapy for heel pain - probably plantar fasciitis and/or Achilles tendinopathy.

Clearly, the treatment was effective, since he then went on to added to his already impressive lifetime gold medal tally.

But low dose radiotherapy isn't only for elite athletes. In fact, it can help 80 - 85% of patients with painful tendinopathies which are not responding to standard treatment, and is a much less invasive alternative to surgery.

Where does radiotherapy fit into the treatment pathway?

Conservative treatments, such as exercises and stretching are simple, low risk interventions, but are not always effective - and are usually only one part of a rehabilitation program.

For some patients that don't respond to conservative management, medical treatments such as shockwave therapy and steroid injections may be offered.

If these treatments do not give lasting results then patients may be referred for surgery, but this is invasive and the recovery period may take many weeks or even months.

Low dose radiotherapy (LDRT) provides an alternative, safe and highly effective option.

Pathology
Tendinopathy
Bursitis
Enthesopathy and Fasciitis
Osteoarthritis

Anatomical Site	Example of Condition
Shoulder	Rotator Cuff Tendinopathy
Elbow	Tennis Elbow
Hand/Wrist	Osteoarthritis De Quervain's Tenosynovitis
Hip	Trochanteric Bursitis (GTPS)
Knee	Patellar Tendinopathy Osteoarthritis
Hand/Wrist, Foot/Ankle	Plantar Fasciitis Achilles Tendinopathy

What is Low-Dose Radiotherapy?

Radiotherapy is used in very high doses to treat cancers by inhibiting their growth. With LDRT, the dose of radiation is around 1/20th and is not intended to affect tissue growth, but is instead used as an anti-inflammatory and tendon healing treatment.

For cancer, a typical treatment dose would be between 60 and 70 Gy of radiation in total. When treating tendinopathy, osteoarthritis or other benign conditions, the total radiation dose used would be as little as 3 Gy. Because the dose is so low, there are typically no side-effects at all.

Diagnostic X-rays do use a dose of radiation which is lower still, but the area of the body irradiated is large and may include the lung, heart, breast etc. In contrast, LDRT is only directed towards areas of the body that are very unlikely to develop cancer - for example, the hand or elbow.

Needless to say, LDRT patients don't come away from treatment glowing with radiation - and their experience of treatment generally is dramatically different to that of cancer patients. Yet the response rate demonstrates that despite (or actually because of) the low doses used, the positive clinical outcomes can be significant.

How does LDRT work?

To understand how and why LDRT achieves the response rates that it does, it's useful to take a step back and consider the concept of inflammation generally.

Inflammation is a defence mechanism against invaders such as viruses and bacteria, and is the immune system's way of recognising and removing of the harmful stimulus, and to start the healing process.

Inflammation causes enlargement of blood vessels, in addition to significantly affecting the cells that line the blood vessels, as well as affecting the immune (white blood) cells.

LDRT counters these effects in a number of ways - including by changing chemical secretion by cells to be less inflammatory, reducing the attachment of white cells to blood vessel lining (endothelial) cells, increasing the rate of white blood cell death, and changing macrophages cells to an anti-inflammatory state.

The result? Inflammation is reduced, pain is diminished, and function is improved.

Who should be treated?

This can be the case for treatment of almost any tendon, tendon attachments (enthesis) or bursas. The most evidence has been gathered for the treatment of plantar fasciitis, Achilles tendinopathy, rotator cuff tendinopathy, greater trochanteric pain syndrome, and tennis or golfer's elbow.

It is best used when patients have undergone a few months of conservative treatments but are still not recovering, and still have pain, have functional issues, and their quality of life is being affected.

When is radiotherapy used?

When a patient visits a doctor for assessment for LDRT for tendinopathy, bursitis or enthesopathy, the first step is to understand how bad their pain is and how it's affecting their function. It's always useful, but not crucial, to look at investigations such as an ultrasound or other imaging, in order to firm up the diagnosis, but if this has not been done, the doctor assessing them will usually be able to request this in their own clinic

If they are eligible for treatment the typical schedule is of six outpatient treatments given over two to three weeks. Each is 10 minutes long and is completely painless.

Typical 2 Week Treatment Schedule											
Mon	Tues	Wed	Thur	Fri	Sat	Sun	Mon	Tues	Wed	Thur	Fri
✓		✓		✓			✓		✓		✓
Ticks indicate days on which treatment takes place											

At each session, radiation is delivered in fractions of 0.5 Gy of radiation per treatment to a total dose of 3 Gy.

How the process of conducting treatment looks

It’s important to note that there are no needles and no cutting. No drowsiness, dizziness, or hair loss is experienced, and other side effects are minimal due to the very low dose of radiation used.

Patients can carry on working, and there’s no rehabilitation required. I also always recommend patients carry on their normal recommended exercise and activity modification programme alongside any medical treatments.

Treatment takes just 10 minutes, and side effects are minimal

This schedule of treatment has an overall significant reduction of pain in 80 to 85% of patients, which tends to take around 3 months to reach its maximum effect.