



BACKGROUND

Heterotopic ossification (HO) – formation of bone in soft tissue, is a major complication after lower extremity trauma, hip arthroplasty, and central nervous system (CNS) injury.¹

Neurogenic heterotopic ossification occurs primarily after traumatic brain injury or spinal cord injury (SCI);² incidence of clinically significant HO in spinal cord injury is approximately 20-30%.² The mechanism, while not entirely elucidated, involves concomitant CNS and peripheral injury, leading to local inflammatory and hypoxic microenvironment in soft tissue, and a resultant release of multiple factors that alter the balance of osteoblastic and osteoclastic activity.²

The **Girdlestone procedure** is an excision arthroplasty of the hip indicated for hardware loosening, prosthetic infections, recurrent dislocations, and HO.

Radiotherapy has been used since the 1970s as a prophylactic measure to deter the progression of HO, with post-surgical radiotherapy having been shown to be more effective than nonsteroidal anti-inflammatory drugs after major hip procedures.³

We present a unique case of unilateral radiotherapy in a patient who underwent surgeries for bilateral hip HO during acute inpatient rehabilitation (AIR), with a focus on functional outcomes.

CASE DESCRIPTION

While in AIR for functional upgrade, the patient developed bilateral hip pain and significant loss of range of motion; ensuing imaging revealed extensive heterotopic ossification (HO) in bilateral hip joints. At that time, he was independent in eating and grooming, but required maximum-assist for bathing, moderate-assist for upper extremity dressing, and total-assistance for lower extremity dressing, toileting, and toilet/tub transfers.

After undergoing a staged bilateral Girdlestone procedure followed by prophylactic radiation on the left, the patient progressed to setup-assistance for eating, grooming, and upper extremity dressing, maximum-assist for lower extremity dressing, and total-assistance for bathing, toileting, and toilet/tub transfers. **After 9 weeks of AIR, he made an outstanding recovery, surpassing his premorbid baseline in nearly all ADLs. He continued to make further gains as an outpatient, when use of a slide board was cleared.**

DISCUSSION

The Girdlestone procedure can be used to treat heterotopic ossification but is often a difficult decision and associated with significant blood loss and emotionally difficult for patients. While post-surgical radiotherapy to the surgical bed has been shown to deter HO progression, **it remains a controversial adjunct treatment given the risks of radiation, including poor incision healing.**

In this case, because the postoperative course of the right hip was complicated by re-ankyloses, the left hip was subsequently irradiated to avoid a similar outcome. Given the patient's marked functional recovery, this case uniquely supports the potential benefits of adjunct radiation therapy in the treatment of HO.

COURSE

50-year-old man with 4-year history of traumatic T5 paraplegia

Acute Inpatient Rehabilitation
1 month

Develops bilateral hip pain & loss of range of motion
Imaging reveals extensive HO in bilateral hips

Right Girdlestone procedure
Complication: re-ankylosis

Acute Inpatient Rehabilitation
1.5 months

Left Girdlestone procedure
Prophylactic radiation with single dose of 8-Gy

Acute Inpatient Rehabilitation
2 months



Figure 1: Plain AP radiograph demonstrating extensive osseous proliferation and deformity of the bilateral hips with complete osseous fusion across the hip joints.



Figure 2: Status post bilateral Girdlestone procedures with adjacent right-sided heterotopic noted.

CONCLUSIONS

- Bilateral Girdlestone procedures with radiation therapy is controversial but can provide an excellent treatment option to restore quality of life and independence in patients with spinal cord injuries.
- This unique case illustrates a favorable outcome and may further benefit other similarly affected patients.

REFERENCES

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