

# Distant Harrington rod migration 35 years after implantation



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## ABSTRACT

Harrington rods have been successfully implanted in thousands of patients for the correction of scoliotic deformity since the 1950s. An exceedingly rare complication of Harrington rod placement is loosening with resultant migration. The authors present a 50-year-old woman who had a single Harrington rod placed when she was 15 years old. Thirty-five years later, she presented with acute sensory changes in her lower extremities. Imaging revealed rod failure and migration of the hardware distally, resulting in penetration of the wall of the rectum. Due to the unique anatomical position of the migrated hardware, sigmoidoscopy was used to directly visualize and remove the rod. The patient ultimately made a full recovery. Rod migration is an exceedingly rare complication that has been described only a few times since the introduction of Harrington rods over 60 years ago. The case herein is particularly unique given the extensive period of time that passed before migration (35 years) and the use of sigmoidoscopy for hardware removal.

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## 1. Introduction

Before the widespread use of pedicle screws and rods,<sup>1</sup> Harrington rod instrumentation was successfully used for over 50 years for the correction of scoliotic deformity. Previously reported complications include hardware fracture, loosening, nonunion and neurological injury. In extremely rare cases, rod migration has been reported. Migration may result in damage to surrounding structures, significant morbidity or death.

## 2. Case report

A 50-year-old woman presented with a chief complaint of six weeks of progressive lower extremity numbness. Notably, she was diagnosed with polio 45 years earlier and developed severe scoliosis. To address her deformity, she underwent an uncomplicated posterior spinal fusion utilizing a single Harrington rod 35 years earlier at the age of 15 years. She made an excellent recovery from her initial surgery and had no significant difficulties until her presentation to clinic.

Physical examination revealed saddle anesthesia and diminished sensation in her bilateral lower extremities extending proximally to her thigh. Motor examination revealed decreased strength from L2 distally. Rectal tone was normal. Further questioning elicited a history of new-onset incontinence. The patient's abdomen was soft and nontender.

Plain radiographs were obtained (Fig. 1) which revealed distal migration of the Harrington rod. A CT scan confirmed migration and raised concern for hardware penetration of the bowel. The patient was therefore admitted with plans for surgical removal of the hardware. Flexible sigmoidoscopy was used to examine the suspected site of perforation. Direct visualization of the rectum revealed frank perforation by the rod with an associated ulceration ten centimeters proximal to the anal verge (Fig. 2).

Using rigid endoscopy, the rod and distal hook were grasped with a long pituitary rongeur and removed transanally. There was no pus or fluid expressed with removal of the hardware (Fig. 3). Subsequently, a laparoscopic diverting loop colostomy

was completed. The patient's postoperative course was uncomplicated. The diverting colostomy was taken down six weeks later and the patient made a full recovery.

## 3. Discussion

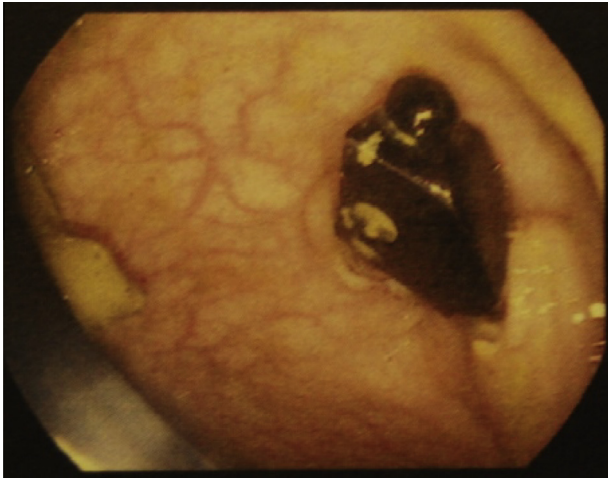
Distant scoliosis rod migration is an exceedingly rare complication. However, there is a small number of previous reports in the literature describing such an occurrence. Wood<sup>2</sup> described a series of two cases of rod migration to the lower extremity and one case to the retroperitoneum. The average time to presentation was nine years after surgery, significantly less than the 35 years in this report. Hirano<sup>3</sup> described migration of a Luque rod through the



**Fig. 1.** Anteroposterior plain radiograph of the abdomen demonstrating distal migration of the Harrington Rod.

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**Fig. 2.** Direct visualization via sigmoidoscopy of the distal rod and hook penetrating the rectum. (For interpretation of the references to colours in this figure legend, the reader is referred to the web version of this paper.)



**Fig. 3.** Harrington rod and distal hook after removal. (For interpretation of the references to colours in this figure legend, the reader is referred to the web version of this paper.)

sacrum and into the wall of the rectum ten years after surgery. Fitchett<sup>4</sup> reported a case of a Harrington rod that migrated into the iliac fossa ten years after surgery. Three other reports described local migration resulting in neurological injury.<sup>5–7</sup> An unusual report by Aylott<sup>8</sup> described embolization of an intraoperative rod fragment to the left pulmonary artery after unconstrained rod cutting.

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In most described cases, the inciting cause of migration was hardware loosening or breakage. Rod fracture has been found to occur in up to 7% of Harrington rods,<sup>9</sup> although migration is significantly less common. Hardware failure frequently occurs in the setting of pseudoarthrosis and fatigue failure. Our case is unique in that the hardware did not break. Instead, the distal hook and rod remained connected and migrated together. It appears that the rod disengaged from the proximal hook, possibly a result of repetitive fatigue or minor trauma. Still, it remains unclear what incited the acute migration of the rod after nearly 35 years of a stable construct.

In planning the surgical removal of the hardware, the unique anatomical position of the rod allowed for sigmoidoscopic extraction. It is interesting that the patient never developed any signs of peritonitis despite clear perforation of her bowel. After hardware removal the diverting colostomy was completed as a precaution given the extensive rectal damage caused by the rod.

Overall, cases of distant scoliosis hardware migration are extremely rare complications that require a patient-specific operative plan. The case described herein was unique given the extended timeline of 35 years to presentation and the use of sigmoidoscopy for hardware removal. With the use of a creative surgical plan, the patient was able to avoid the risk of a large open procedure and made a full recovery.

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