

Fluoroscopy-guided Sacroiliac Joint Steroid Injection for Low Back Pain in a Patient with Osteogenesis Imperfecta

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ABSTRACT

Background: Osteogenesis imperfecta, also known as 'brittle bone disease', is a genetic connective tissue disease. It is characterized by bone fragility and osteopenia (low bone density). In this case, a 57-year old female presented to the University Hospital of the West Indies (UHWI), Physical Medicine and Rehabilitation Clinic with left low back pain rated 6/10 on the numeric rating scale (NRS). Clinically, the patient had sacroiliac joint-mediated pain although X-rays did not show the sacroiliac joint changes. Fluoroscopy-guided left sacroiliac joint steroid injection was done.

Methods: Numeric rating scale and Oswestry Disability Index (ODI) questionnaire were used to evaluate outcome. This was completed at baseline, one week follow-up and at eight weeks post fluoroscopy-guided sacroiliac joint steroid injection.

Results: Numeric rating scale improved from 6/10 before the procedure to 0/10 post procedure, and ODI questionnaire score improved from a moderate disability score of 40% to a minimal disability score of 13%. Up to eight weeks, the NRS was 0/10 and ODI remained at minimal disability of 15%.

Conclusion: Fluoroscopy-guided sacroiliac joint injection is a known diagnostic and treatment method for sacroiliac joint mediated pain. To our knowledge, this is the first case published on the use of fluoroscopy-guided sacroiliac joint steroid injection in the treatment of sacroiliac joint mediated low back pain in a patient with osteogenesis imperfecta.

Keywords: Fluoroscopy-guided, osteogenesis imperfecta, steroid injection

Inyección Intraarticular de Esteroides en la Articulación Sacroilíaca Guiada por Fluoroscopia para el Dolor Lumbar en una Paciente con Osteogénesis Imperfecta

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RESUMEN

Antecedentes: La osteogénesis imperfecta, también conocida como "enfermedad de los huesos frágiles", es una enfermedad genética del tejido conectivo. Se caracteriza por fragilidad ósea y osteopenia (baja densidad ósea). En este caso, una mujer de 57 años acudió a la Clínica de Medicina Física y Rehabilitación del Hospital Universitario de West Indies (HUWI), con dolor lumbar izquierdo de intensidad 6/10 en la Escala Numérica del Dolor (END). Clínicamente, la paciente presentaba dolor mediado por la articulación sacroilíaca, aunque las radiografías no mostraron los cambios de la articulación sacroilíaca. Se le practicó una inyección de esteroides en la articulación sacroilíaca izquierda, guiada por fluoroscopia.

Métodos: Se utilizaron la Escala Numérica del Dolor y el cuestionario del Índice de Discapacidad de Oswestry (IDO) para evaluar el resultado. Ambos fueron aplicados al inicio del estudio, en un segui-

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miento de una semana, y a las ocho semanas posteriores a la inyección de esteroides en la articulación sacroiliaca, guiada por fluoroscopia.

Resultados: La Escala Numérica del Dolor indicó un mejoramiento de 6/10 antes del procedimiento, a 0/10 con posterioridad al procedimiento, y la puntuación del cuestionario IDO mejoró de una puntuación de discapacidad moderada de 40% a una puntuación de discapacidad mínima de 13%. Hasta la octava semana, la END fue 0/10 y el IDO permaneció en la discapacidad mínima de 15%.

Conclusión: La inyección de la articulación sacroiliaca guiada por fluoroscopia es un método de diagnóstico y tratamiento conocido para el dolor mediado de la articulación sacroiliaca. Hasta dónde sabemos, éste es el primer caso publicado acerca del uso de la inyección de esteroides en la articulación sacroiliaca guiada por fluoroscopia para el tratamiento del dolor lumbar mediado por la articulación sacroiliaca en un paciente con osteogénesis imperfecta.

Palabras claves: Guiada por fluoroscopia, osteogénesis imperfecta, inyección de esteroides

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INTRODUCTION

Osteogenesis imperfecta, also known as 'brittle bone disease', is usually as a result of a genetic connective tissue disease with autosomal inheritance, or a smaller percentage of recessive variant or unknown genes (1, 2). This is a relatively rare disease, where one in every 15 000–20 000 births is affected (3). Connective tissue is directly related to collagen, which is ubiquitous in the human body and, as such, osteogenesis imperfecta is a systemic disorder which affects various body functions. This includes susceptibility to bone fractures and bone deformity, the eye manifestation as 'grey sclera' or 'blue sclera', hearing loss, joint laxity, restrictive pulmonary disease, cardiovascular and neurological features, short stature and dentinogenesis imperfecta which is teeth discoloration (most often blue-grey or yellow-brown colour changes) and translucency (1, 4). The connective tissue is defective or deficient as a result of the replacement of the amino acid glycine by bulkier amino acids in the collagen triple helix (1). The genes, COL1A1 and COL1A2 that code for Type 1 collagen protein, undergo mutation, which leads to collagen alteration and dysfunction at the extracellular matrix or tissue levels (1, 5). There are eight known types of osteogenesis imperfecta (I to VIII), which vary in severity and characteristics (6). The most benign form is Type I and the most severe is Type II. Multiple skeletal complaints are reported by patients with osteogenesis imperfecta and low back pain is a common symptom (7). Recent developments have shown that for effective management of osteogenesis imperfecta, there should be a multidisciplinary approach involving, more importantly, physiotherapy, rehabilitation and orthopaedic surgery in addition to a myriad of other disciplines, depending on which system is involved (8).

While the sacroiliac joint (SIJ) may be a source of low back pain, the symptoms are nonspecific and may be similar to symptoms seen in other lumbosacral pathologies (9). The determination of the SIJ as the source of low back pain can be done using a series of six provocation SIJ tests, which have significant diagnostic utility. They include: sacral distraction, thigh thrust, sacral compression, sacral thrust tests and

Gaenslen's test; three or more positive tests of the six provocative tests produce the highest likelihood ratio (9).

CASE REPORT

A 57-year old female who is known to have osteogenesis imperfecta presented to the Physical Medicine and Rehabilitation Clinic with left-sided low back pain for 12 months. She was also being managed by an orthopaedic surgeon who referred her for aquatic therapy. Aquatic therapy gave her minimal improvement for the low back pain and she developed new onset of neck pain. She discontinued aquatic therapy and the neck pain resolved but her low back pain persisted. She rated her low back pain 6/10 on the numeric rating scale (NRS), and said it was worse with lying down and sometimes relieved with changing position. The Oswestry Disability Index (ODI) was 40%, which evaluated her as having moderate disability. Her past medical history included right slipped capital femoral epiphysis (SCFE) at age 11 years, right hip arthroplasty at age 21 years (1975) with revision at age 26 years (1980), and in 1991, at age 37 years, she had right total hip arthroplasty. She also has a history of cervical spondylosis, thoraco-lumbar scoliosis with a limb length discrepancy and she was also found to have ascending acetabulum on the left.

Examination revealed a middle-aged female who walked with a limp. She was noted to have thoraco-lumbar scoliosis and a limb length discrepancy; left anterior superior iliac spine (ASIS) to medial malleolus was 122 cm on the left and 119 cm on the right. Range of motion of the lumbosacral spine was decreased in all range. Sensation was intact in all lower extremity dermatome. Muscle strength was 5/5 distally and 4/5 at the hip flexors and extensors. Patellar and Achilles reflexes were 2+ and symmetrical. Straight leg raise was negative in bilateral lower extremities. Patrick Fabere test was positive on the left and was not done on the right because of the history of multiple surgeries including the total hip replacement. Sacral distraction provocation test, thigh thrust test, sacral compression and sacral thrust tests were positive on the left and negative on the right, with the exception of thigh thrust which

caused discomfort in the right hip. She had tenderness to palpation over the left sacral sulcus area and the right was non-tender.

Diagnosis of osteogenesis imperfecta Type IV and possible sacroiliac joint mediated pain was made. Confirmation of the sacroiliac joint as the source of her pain was made by the absence of pain following fluoroscopic-guided injection of the joint using lidocaine and steroid. The patient was advised to use a sacroiliac joint belt when active.

The procedure was done with the patient positioned prone. The region overlying the left sacroiliac joint was identified using superficial landmarks and fluoroscopy. Under sterile conditions, the skin over the inferior aspect of the left sacroiliac joint was cleaned with betadine and draped. A 22-gauge needle was used to anaesthetize the skin using 4 mL of 1% lidocaine. Using fluoroscopy guidance, a 22-gauge 3½ inch quinke needle was used to enter the left sacroiliac joint from below. Omnipaque was used to confirm intra-articular flow (Figure). No vascular uptake was noted. One millilitre of triamcinolone (40 mg/mL) with 1 mL of 1% lidocaine was then injected. The absence of pain with provocative tests confirmed the sacroiliac joint as the source of her pain. Pre-procedure pain was 6/10 on NRS and her post procedure NRS was 0/10.

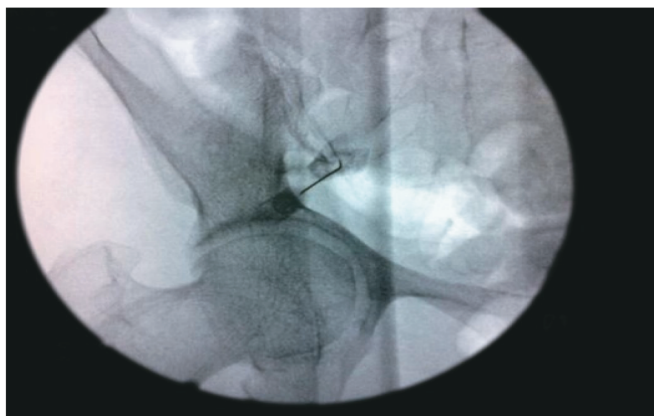


Figure: Fluoroscopy imaging of left sacroiliac joint injection with contrast.

At one week follow-up, her pain was 2/10, the ODI decreased from 40% to 13% and her ODI disability improved from moderate to minimal disability. At eight weeks post sacroiliac injection, she rated her pain at 0/10 and ODI was 15%.

At ten weeks after SIJ injection, she continued to have no pain in the left lower back or buttocks. She accidentally slipped and fell on her back at about week 10 post injection and sustained an anterior wedge compression fracture of the second lumbar vertebra (L2) which was treated non-operatively. At four months follow up, she continued to be asymptomatic in the sacroiliac joint and was recovering well from the compression fracture.

DISCUSSION

Osteogenesis imperfecta can be defined and diagnosed solely by its clinical features. However, collagen biopsy and DNA testing as well as bone densitometry can help with confirmation. This patient was diagnosed with osteogenesis imperfecta Type IV, and her main complaints were related to fragile bones, thoraco-lumbar scoliosis, limb length discrepancy and low back pain. Orthopaedic management along with rehabilitation was pivotal in maximizing and maintaining her optimal health. Due to multiple system involvement in patients with osteogenesis imperfecta, a multidisciplinary team approach should be instituted.

Limb length discrepancy is found in 40–70% of the population and is often associated with low back pains (7, 10). In most cases, the low back pain affects the lumbar spine, lumbosacral junction and the sacroiliac joint. Some patients may also have limb length discrepancy-associated scoliosis which is regarded as compensatory, non-structural and non-progressive (7, 11). The use of the SIJ provocative tests during evaluation increased the likelihood of having a positive intra-articular SIJ block. While fluoroscopy-guided SIJ injection is a known diagnostic and treatment method for SIJ mediated pain, there has been no published study to the authors' knowledge which examined its use in patients with osteogenesis imperfecta. Due to the brittle nature of the bone in osteogenesis imperfecta, discerning needle placement in the SIJ during injection may be challenging. With fluoroscopy and proper placement of the needle, the joint can be successfully infiltrated with steroid and lidocaine and the patient benefit from pain relief. This case demonstrates the significant role that fluoroscopy-guided SIJ steroid injection can play in the treatment of SIJ-mediated low back pain in patients with osteogenesis imperfecta.

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