CASE REPORT

Leg length discrepancy: the importance of a complete history and examination

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Accepted 12 November 2017

SUMMARY

A 26-year-old woman with a 1-year history of right knee pain had failed to respond to analgesia and activity modification in the community. Her general practitioner referred her to the orthopaedic department for specialist review. A thorough history revealed that she had multiple orthopaedic interventions as a child. The patient had significant postoperative infection of the left knee following knee surgery at 7 years of age. Examination demonstrated the presence of a limp, scoliosis and suspected leg length discrepancy. Plain film radiography confirmed the presence of leg length discrepancy, with the right limb measuring 30 mm longer than the left. The leg length discrepancy was likely secondary to a growth arrest of the left knee following the postoperative infection in childhood. The patient was managed with physiotherapy and heel raises and received regular orthopaedic follow-up.

BACKGROUND

This case highlights the necessity for all medical practitioners to review and assess patients in a complete and systematic way. This allows for prompt management to be initiated and can prevent secondary complications.

At the time of presentation to the orthopaedic department, the patient had a year long history of pain and demonstrated a compensatory scoliosis. A comprehensive orthopaedic history and examination, including gait analysis, inspection of both limbs, and palpation and movement of the limbs demonstrated leg length discrepancy. A review by Murray and Azari concluded that leg length discrepancy may be an important cause of osteoarthritis of the knee, hip and lumbar spine.¹ The patient was then commenced on treatment with corrective heel raises, physiotherapy and regular follow-up to try and prevent further complications.

CASE PRESENTATION

A 26-year-old woman was referred to the orthopaedic department from her general practitioner (GP) with a 1-year history of progressing right knee pain associated with activity. Despite activity modification and simple analgesia, the pain persisted, and the GP referred her for a specialist review following a normal plain film radiograph of the right knee.

In the orthopaedic clinic, she complained of medial and anterior right knee pain. A detailed history

highlighted a significant orthopaedic surgical history. As a child, she had surgery for bilateral patellofemoral instability. Aged 7 years, her left-sided surgery was complicated by a joint infection requiring multiple washouts and debridements.

On examination, the patient stood with the right knee flexed and right hip internally rotated. When asked to straighten the right knee, a pelvic tilt and compensatory scoliosis were demonstrated, indicating that the right leg was probably longer than the left.

During gait analysis, the patient mobilised with the right knee flexed and internally rotated in order to keep the pelvis square. This results in dynamic valgus which in turn leads to lateral patellofemoral overload which is a common cause of anterior knee pain. On assessment of single-leg squat, the patient had poor technique due to gluteal muscle weakness, and the knee again went into dynamic valgus. The rest of the right knee examination was unremarkable.

Examination of the left knee demonstrated scars associated with previous surgery but was otherwise unremarkable.

The history and examination alerted the orthopaedic team to a differential diagnosis of leg length discrepancy, likely secondary to postoperative infection as a child.

As a result, further investigations including long leg plain film radiography were ordered.

INVESTIGATIONS

Plain film radiography of the knees demonstrated a normal right knee and mild tricompartmental arthritis in the left knee.

Weight-bearing long leg plain film radiography demonstrated a right-sided discrepancy of 30 mm (measured as the difference between the height of the two femoral heads) and significant pelvic obliquity (figure 1).

DIFFERENTIAL DIAGNOSIS

Leg length discrepancy was confirmed, likely secondary to growth arrest of the left limb following postsurgical knee infection. The left knee also demonstrated osteoarthritis.

The leg length discrepancy resulted in lateral patellofemoral overload due to the abnormal gait pattern.

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To cite: Coffey D, Hudson-Phillips SP, Radha SS, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-220985

Figure 1 Leg length measurement X-ray demonstrating a discrepancy. Apparent coxa vara deformity of the right hip, genu valgus of the right knee and degenerative changes of the left knee are also demonstrated.

TREATMENT

Despite the patient presenting with knee pain, the treatment was to correct the leg length discrepancy with a heel raise to readjust the loading characteristics of the patellofemoral joint.

OUTCOME AND FOLLOW-UP

The patient received heel lift inserts, regular physiotherapy and orthopaedic follow-up. Physiotherapy included core stabilising exercises, gluteal and leg muscle strengthening and postural

Learning points

- ▶ Thorough medical and surgical histories are essential in the assessment of the orthopaedic patient presenting with joint pain.
- ▶ Examination of the limb must include comparison with the unaffected limb. This must include inspection of the patient, gait analysis, and palpation and movement of both limbs.
- ▶ Early recognition of leg length discrepancy is essential and can be corrected simply with heel raises, potentially avoiding long-term sequelae.

restoration. Following 6 months of treatment, symptoms were improving.

DISCUSSION

Leg length discrepancy occurs in about 40%–70% of the population. Most have a leg length difference smaller than 20 mm.²

Leg length discrepancy of more than 10 mm is associated with prevalent radiographic and symptomatic osteoarthritis of the shorter leg,³ with some studies linking leg length discrepancy to scoliosis.⁴

Mild leg length discrepancy (0–30 mm) is most commonly treated with shoe inserts.⁴

One case reported a reduction in meralgia paraesthetica in a patient with a leg length discrepancy following the intervention of a 15 mm heel lift.⁵

Contributors DC: Lead author, collated the information regarding the case and produced the text body and original drafts. SPH-P: Contributing author, produced the literature review and edited the initial drafts. SSR: Contributing author, coauthored the text body and provided senior advice on the case. SB: Supervisor, consultant in charge of patient care and reviewed and edited the final drafts.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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