

CASE REPORT

Case report: imaging the clinical course of FOPE—a cause of adolescent knee pain

Thomas Bochmann*, Richard Forrester, and Jon Smith

Department of Orthopaedic Surgery, Pinderfields General Hospital, Wakefield, UK

*Correspondence address. Department of Orthopaedic Surgery, Pinderfields General Hospital, Wakefield WF1 4DG, UK.

E-mail: t.bochmann@doctors.org.uk

Abstract

Focal periphyseal oedema (FOPE) is a rare MRI finding associated with pain in adolescent patients with very few reported cases. We present a case of FOPE in a 13-year-old girl and the only follow-up imaging available for an isolated presentation of this condition. This article describes a clinical course that correlates well with the imaging obtained. This article describes a clinical course that correlates well with the imaging obtained.

INTRODUCTION

We present the case of a 13-year-old girl with left knee pain, an MRI diagnosed focal periphyseal oedema (FOPE) lesion and no other identified injury or morphological abnormality. According to our literature search, this is the only case report that provides follow-up images for a case of isolated symptomatic FOPE.

FOPE is a term used to describe the MRI finding of bone marrow oedema situated around a physis at the time of its fusion, and affects lower limb bones of the adolescent skeleton in either sex [1]. This is a rare finding of uncertain aetiology and significance that has shown itself to be a self-limiting condition [1, 2].

FOPE lesions have so far only been described in patients with pain in the knee. Most often they are active adolescents, and it may occur with or without a definitive history of trauma and associated injury [1, 2].

Proposed theories for the aetiology and significance of FOPE lesions were made when it was initially named in 2011 [1]. However, the volume of evidence currently in existence and the lack of basic science mean that at present these are untested.

A literature search using Pubmed and Medline produced just two papers [1, 2] presenting a total of 15 cases, of which only five had isolated findings of FOPE. The remaining cases all

had evidence of concomitant injury, morphological abnormality or musculoskeletal disease complicating the clinical picture.

None of the five cases of isolated FOPE underwent MRI imaging follow-up and so it is difficult to see if their symptoms correlated with changes to the FOPE lesion.

CASE REPORT

The images presented here are those of a fit and active 13-year-old girl with no significant medical history. She complained of intermittent pain, swelling and locking in the left knee of nine months duration.

Her symptoms arose following a twisting injury sustained when she fell from a horse and settled into their intermittent pattern after an initial period of pain, swelling and reduced mobility that lasted for one week. Clinical findings at the time of injury were unremarkable and x-ray imaging (Fig. 1) was normal for the age of this patient.

On examination at nine months she had medial tenderness and a positive McMurray's test, raising the suspicion of meniscal injury, for which the initial MRI investigation was performed. This scan showed a focal region of oedema centred in the medial aspect of the distal femoral physis with no other internal derangement, and she was managed with observation.

Received: July 24, 2016. Accepted: October 13, 2016

Published by Oxford University Press and JSCR Publishing Ltd. All rights reserved. © The Author 2016.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

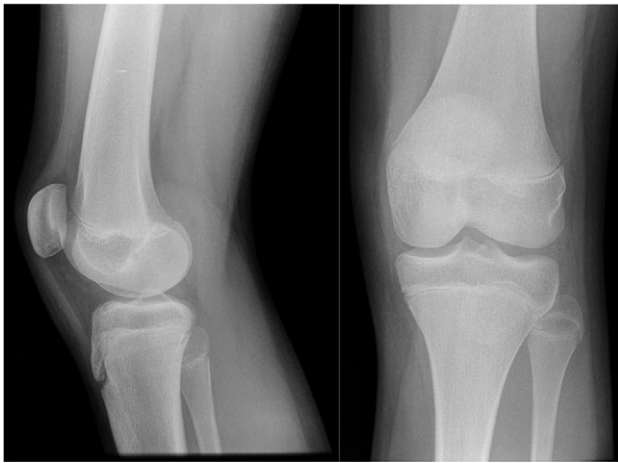


Figure 1: AP and lateral radiographs of the knee from the time of initial injury.

The follow-up MRI images show the progression of the FOPE lesion over a four month period. There is a clear reduction in the intensity of the signal produced by the FOPE lesion in all three planes of the imaging (Fig. 2) although resolution is not complete.

Her symptoms gradually improved without treatment, and with the significant improvement seen on her MRI scan she was eventually discharged from our care fourteen months after her initial injury.

DISCUSSION

Whilst coining the term FOPE, Zbojniec and Laor [1] also attempted to theorize its underlying aetiology. They suggest the possibility of micro-fractures from athletic activity or trauma before going on to conclude that it may be an incidental finding relating to endochondral ossification, which may or may not be painful.

Their final conclusion was based on the preponderance for FOPE lesions to occur in adolescents during physeal fusion coupled with the presence of additional pathology in the majority of cases. However, the apparent correlation with athletic activity or trauma, and the absence of reported asymptomatic cases does not support this conclusion.

The case described here shows a progression of the FOPE lesion towards resolution that is well correlated with the clinical development experienced by our patient. The story clearly relates to trauma in an active adolescent, and is very similar to that described previously.

This suggests that in this case FOPE was the cause of pain and that our findings support the theory that trauma may play a role its aetiology.

This case is in keeping with the previously described cohort of affected patients and supports the current data suggesting

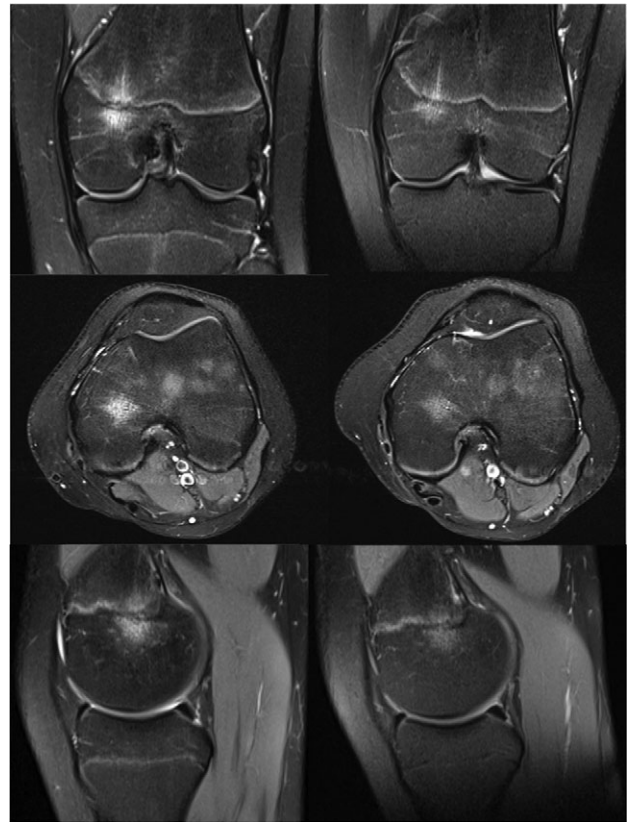


Figure 2: MRI images of the knee at 9 (left) and 13 months (right) after initial injury.

that FOPE is a self-limiting condition that does not require any invasive investigation or management.

It provides added insight into the progression of FOPE that has previously not been reported and suggests that trauma is implicit in the development of FOPE lesions.

CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. Zbojniec A, Laor T. Focal periphyseal edema (FOPE) zone on MRI of the adolescent knee: a potentially painful manifestation of physiologic physeal fusion? *AJR AM J Roentgenol* 2011;197:998–1004.
2. Beckmann N, Spence S. Unusual presentations of focal periphyseal edema zones: a report of bilateral symmetric presentation and partial physeal closure. *Case Rep Radiol* 2015; 2015:465018.