

Yasuhisa Maezawa  
Hisatoshi Baba  
Kenzo Uchida  
Nobuaki Furusawa  
Chikara Kubota  
Kyoko Yoshizawa

## Spontaneous remission of a solitary intraspinal synovial cyst of the lumbar spine

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Y. Maezawa (✉) · H. Baba · K. Uchida  
N. Furusawa · C. Kubota · K. Yoshizawa  
Department of Orthopaedic Surgery,  
School of Medicine,  
Fukui Medical University,  
Shimoaizuki 23, Matsuoka,  
Fukui 910-1193, Japan  
e-mail: ymaezawa@fmsrsa.fukui-med.ac.jp,  
Tel: +81-776-61-8383,  
Fax: +81-776-61-8125

**Abstract** We report on a 15-year-old boy in whom a spontaneous remission of a symptomatic synovial cyst, possibly emanating from the L4-5 facet joint, was noted. The medical history suggested that sport-related overactivity and/or minor trauma was the underlying cause. Conservative treatment for several months may be one treatment option if the cyst wall is not calcified and the symptoms and signs related to

radiculopathy show a gradual decrease.

**Key words** Lumbar spine · Synovial cyst · Radiculopathy · Facet joint

### Introduction

The number of reported synovial cysts of the lumbar spine have been increasing probably due to the availability of magnetic resonance imaging (MRI) technique. [9, 13, 15, 17, 20]. These cysts are usually associated with osteoarthritis of the adjacent facet joint, degenerative spondylosis and/or spondylolisthesis, particularly in middle aged or elderly patients. The majority of such cysts require surgical resection due to persistent radicular symptom and/or occasional pareses.[2, 4–21]. We report an unusual young patient in whom a symptomatic intraspinal juxta-articular cyst showed spontaneous remission through cessation of sport activity and immobilisation of the lumbar spine.

### Case report

A 15-year-old junior high school student was referred to our University Hospital with a 2-month history of pain in the lower lumbar spine radiating to the left lower leg. He was a member of the school football team and had played football several hours each day over the preceding 2 years. He had sprained his back during a football game 2 months before referral. On admission, the patient appeared otherwise healthy and neurological findings were unre-

markable except for a slight hyperaesthesia in the left L5 dermatome. Hamstring tightness was noted on the left side, blood tests were normal and the rheumatoid factor was negative.

X-ray of the lumbar spine showed no osteoarthritic changes in the facet joints or spondylolytic and spondylolisthetic changes. MRI showed an extradural cystic lesion that was isointense on a T1-weighted image and markedly hyperintense on a T2-weighted image (Fig. 1) just anterior to the left L4–5 facet joint. These findings suggested that the lesion was an intraspinal juxta-articular synovial cyst from the left L4–5 facet joint.

The patient was treated conservatively with a standard lumbo-sacral brace in our out-patient clinic. Three months later, all symptoms and signs related to L5 radiculopathy spontaneously and completely disappeared. MR images showed spontaneous remission of the cystic lesion (Fig. 2). The patient has been doing very well for the last 2 years without any neurological signs of lumbar radiculopathy.

### Discussion

A variety of space-occupying lesions within the lumbar spinal canal are associated with neurological compromise. Of these, non-neoplastic epidural cysts include arachnoid cyst, neurenteric cyst, perineural cyst (Tarlov), ganglion cyst, and synovial cyst. Intraspinal lumbar synovial cysts are relatively uncommon lesions.



The aetiology of intraspinal synovial cysts is still unknown, but they are considered to develop secondary to osteoarthritis of the facet joints [4, 13, 16] and to spondylolisthesis. [4, 17, 21]. This would account for their high frequency (75%) at L4-5 [15], which is the level of greatest motion in the lumbar spine. The accepted mechanism for the pathogenesis of these lesions is excessive joint mobility with herniation of the synovium through a defective joint capsule. Other pathogenic mechanisms include:

1. Myxoid degeneration of periarticular fibrous tissue following trauma
2. Increased secretion by fibroblasts
3. Growth of developmental synovial rests, or
4. Proliferation of pluripotential mesenchymal cells.[17].

Our patient was unusually young and, based on other reports describing the mechanism of excess stress such as motion and direct trauma, [2, 7, 18], the clinical history suggested that sport- (football-) related overactivity possibly caused partial distraction and injury of the left L4-5 facet joint, herniation of the synovial lining into the adjacent ligamentum flavum, and gradual proliferation and expansion of the cystic element by accumulation of viscous synovial fluid with acute haemorrhage, resulting in neurological symptoms.

Based on the MRI features, [9, 13, 15, 17, 20], a synovial cyst is defined as a smooth, extradural, well-circumscribed, cystic mass arising adjacent to the facet joint. Synovial cysts without haemorrhage appear isointense, or slightly hyperintense, relative to the cerebrospinal fluid on T1-weighted images, due to the high protein content within the cyst. In some cases, haemorrhage into the cyst may occur, [11], followed by peripheral and internal calcification within the lesion. [4, 16]. The low signal intensity at the rim of the haemorrhagic cyst on T2-weighted MR images is probably due to the presence of a fibrous capsule with haemosiderin deposits noted pathologically.

Treatment of synovial cysts usually consists of surgical resection, percutaneous injection, [3] aspiration [1] and immobilisation using a brace [13, 15]. Surgery is a safe and effective treatment for patients with lumbar synovial cysts and is the treatment of choice for such lesions [20]. However, a few reports have described a dramatic decrease in the size of synovial cyst and even complete disappearance during the operation, compared with its appearance on initial MR images [9, 12, 14]. We suggest that

**Fig. 1** Magnetic resonance imaging (MRI) findings in our case at first visit. **A** The cystic lesion appears isointense on a T1-weighted (TR, 400 ms, TE, 14 ms) MR image. **B** T2-weighted (TR, 4500 ms, TE, 84 ms) MR image shows the lesion as an area of markedly hyperintense signal anterior to the left L4-5 facet joint, and demonstrates continuity with the joint capsule

**Fig. 2** MRI of the patient at 3 months follow-up after the first visit. Axial T2-weighted (TR, 4000 ms, TE, 84 ms) image shows disappearance of the lesion and good visualisation of the left L5 nerve root

surgical decompression is indicated in the presence of progressive intractable pain and neurological deficit, but conservative treatment for several months may be one treat-

ment option if the cyst wall is not calcified and the symptoms and signs related to radiculopathy show a gradual decrease.

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