

Cervical disc calcification in children: a case report

PD Aker, BSc, DC*

AA Lopes, BSc, DC*

K Yong-Hing, MD, FRCS(Glasgow), FRCSC**

JD Cassidy, DC, MSc(Orth), FCCSC(C)***

A case of intervertebral disc calcification in a child is presented. This uncommon cause of neck pain and stiffness has a benign, self-limited course in the majority of cases. Although the presenting features are non-specific, it is important to differentiate disc calcification from disc infection. The clinical picture, radiographic signs, and differential diagnosis are discussed. (JCCA 1989; 33(4): 191-194)

KEY WORDS: intervertebral disc calcification, children, intervertebral disc infection, cervical spine, chiropractic, manipulation.

On présente le cas d'un enfant faisant voir la calcification d'un disque intervertébral. Cette cause peu commune de douleur et de raideur au cou possède une évolution bénigne et spontanément résolutive dans la plupart des cas. Bien que les caractéristiques révélatrices ne soient pas spécifiques, il est important de différencier la calcification discale et l'infection discale. (JCCA 1989; 33(4): 191-194)

MOTS CLÉS: calcification discale, enfants, infection discale, colonne cervicale, chiropratique, manipulation.

Introduction

In a child presenting with a painful neck, restricted neck movements, or torticollis, serious underlying pathology must be excluded. Radiographs and laboratory bloodwork are helpful first-line diagnostic tests if the history and physical examination are not conclusive.

Although paediatric radiographs are often difficult to interpret¹, they can be helpful in differentiating between benign and life-threatening disorders. Calcification of the intervertebral disc is a condition not normally considered in the differential diagnosis of a child with neck or back pain. Although not commonly seen, it should be recognized as a benign, self-limiting condition that usually requires only short-term conservative management.

The following case describes a child with cervical intervertebral disc calcification. The clinical and radiographic presentation, and differential diagnosis of this uncommon disorder are discussed.

Case report

A nine-year-old boy was seen in the Orthopaedic Outpatient Clinic with an eight day history of posterior and left-sided neck pain. He noticed the pain upon awakening one morning, but could not recall any specific trauma. The pain was worse with neck movements, particularly left rotation. There was no radiation of pain into the arms. Swallowing caused pain. He had been manipulated by a chiropractor in several areas including the neck, back, and legs during the month prior to the onset of his symptoms.

On examination, he was mildly tender to deep palpation at the mid-cervical level. All movements were full except for extension and left rotation which were decreased to 80% of normal. Muscle strength, reflexes and sensation were normal in the upper and lower extremities.

Laboratory bloodwork including ESR, white cell count, alkaline phosphatase, and serum calcium were unremarkable.

Cervical spine radiographs show calcification of the C5-C6 disc with some extension of the calcification anteriorly, beyond the boundaries of the vertebral body margins (figure 1, a and b). There is a small spondylophyte at the anterior aspect of the C5 vertebral body, but otherwise the disc space appears well-maintained. Prevertebral soft tissues are unremarkable. A CT scan of the mid and lower cervical spine shows the described C5-C6 intervertebral disc calcification extending anteriorly. The spondylophyte at the antero-inferior aspect of the C5 vertebral body is also seen, extending more toward the left than the right. There is no abnormality within the spinal canal (figure 2).

This boy was diagnosed as having intervertebral disc calcifi-

* Clinical Resident, Canadian Memorial Chiropractic College, Toronto, Ontario.

** Department of Orthopaedics, University Hospital, Saskatoon, Saskatchewan.

*** Department of Pathology, University Hospital, Saskatoon, Saskatchewan. Reprint requests to: Dr. J. David Cassidy, Fourth Avenue Chiropractic Clinic, 208 - 119 Fourth Avenue South, Saskatoon, Saskatchewan S7K 5X2.

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cation and was managed conservatively with a soft collar and rest.

At follow-up, three weeks later, the pain had completely abated and he returned to full activity. Ranges of motion were full and painfree and there was no tenderness in the neck. Repeat cervical spine radiographs showed no change in the disc calcification.

Discussion

Paediatric intervertebral disc calcification was first described by Baron in 1924, and over 100 cases have been described in the literature since. Although asymptomatic, cervical disc calcification is relatively common in adults with advancing age, but it is uncommon and often symptomatic in children².

Epidemiology

The etiology of childhood disc calcification is unknown, although thirty percent of symptomatic patients report a history of trauma and fifteen percent report previous upper respiratory tract infection². There is no explanation for these associations

and, in general, there are no recognized predisposing factors. Other causes of calcification in paediatric connective tissues, such as hypervitaminosis D and chondrocalcinosis, have no relationship to this condition². Ochronosis, hyperparathyroidism, and haemochromatosis, which are recognized as causes for disc calcification in adults, are not present in children. There is no evidence to suggest a generalized metabolic defect or a defect in calcium metabolism. There is, however, a report of one case associated with I-cell disease, a genetic disorder that causes excessive cartilage degeneration and skeletal dysplasia³. Congenital heart disease has been found to be associated with asymptomatic, multilevel thoracic disc calcification⁴.

Intervertebral disc calcification affects children of any age, with a peak incidence between five and ten years of age and a slight male predominance⁵. It most commonly involves the cervical spine followed by the thoracic spine, but rarely involves the lumbar spine. The majority of cases are unilevel, with the C6–C7 level most commonly affected. In the cervical spine, disc calcification is usually symptomatic and unilevel, while in the thoracic spine it is usually asymptomatic and multilevel².

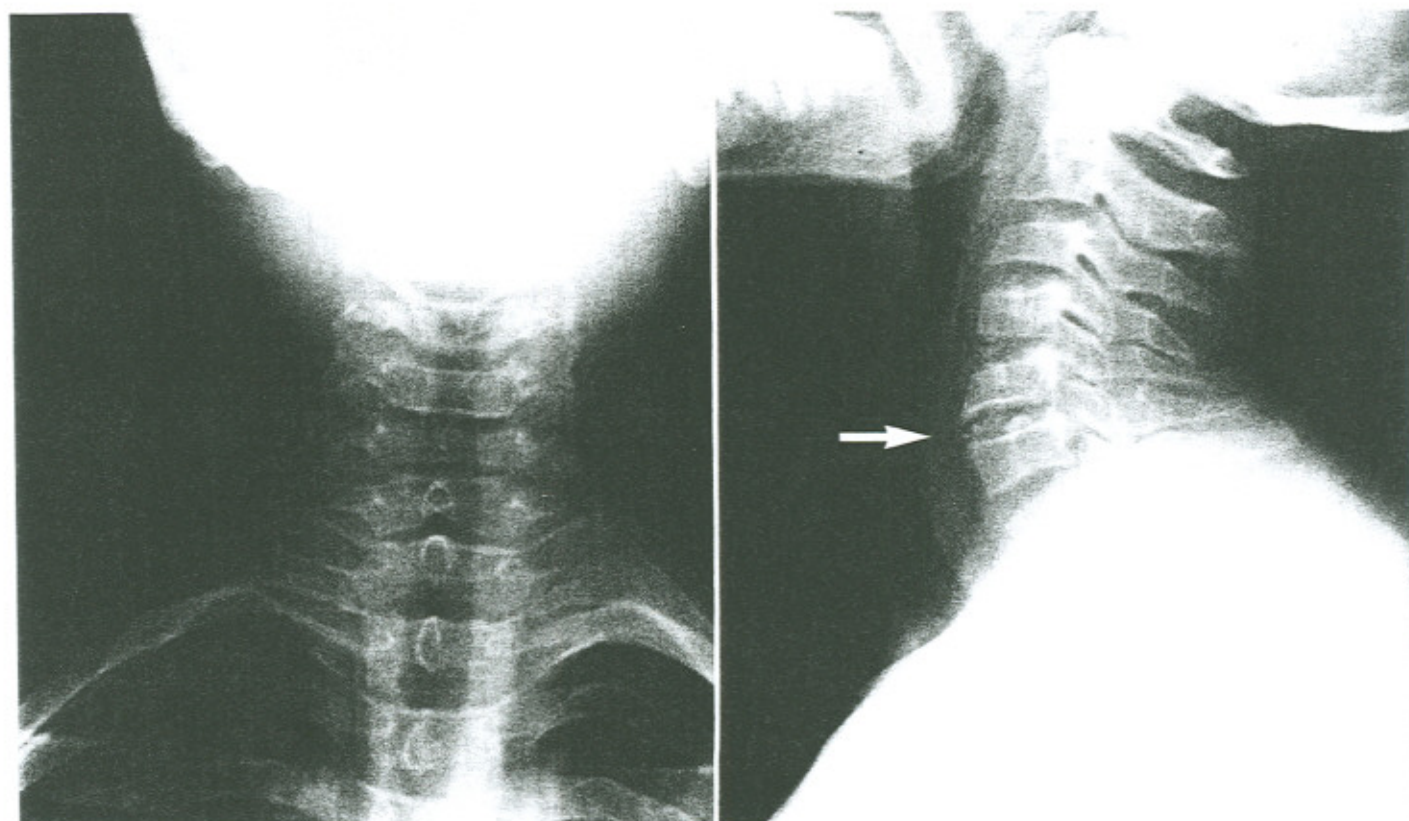


Figure 1. (a and b) Anteroposterior and lateral radiographs of the cervical spine showing calcification of the intervertebral disc at the C5–C6 level (arrow) with extension anteriorly beyond the boundaries of the vertebral body margins. There is a small spondylophyte at the anterior aspect of C5 vertebral body.

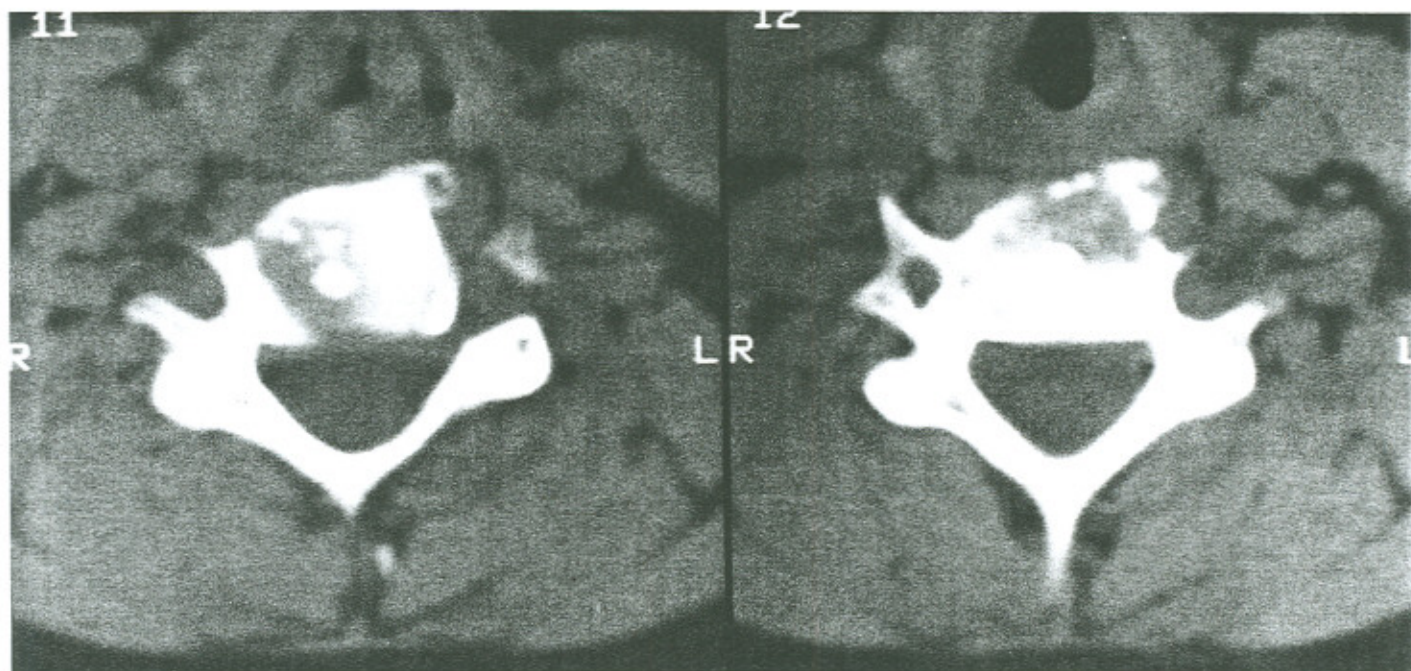


Figure 2. CT scan of the mid and lower cervical spine shows the intervertebral disc calcification extending anteriorly at the C5–C6 level. The spondylophyte at the anteroinferior aspect of the vertebral body of C5 is seen extending more towards the left than the right. No abnormality is seen within the spinal canal.

Diagnosis

When symptomatic, intervertebral disc calcification presents most commonly with pain, decreased range of motion, torticollis, and local tenderness, although dysphagia due to anterior protrusion of the disc has been reported⁶. Neurologic involvement is unusual, but when present can cause either radicular or long-tract signs. Children are usually afebrile, with the ESR and white-cell count rarely elevated².

The diagnosis of this disorder is based on radiographic evidence of calcification within the intervertebral disc. Deposits are visualized as amorphous densities within the nucleus pulposus without involvement of the annular fibers (figure 1, a and b). Posterior or anterior herniation of the disc may be present and is best visualized with a CT scan⁷ (figure 2). In the majority of cases, radiographic changes resolve without deformity, but flattening of the vertebral body, anterior spondylophyte formation, disc space narrowing, and persistent disc calcification have been reported^{8,9}.

The pathology of the calcific material has been described by Swick⁵. The normal gelatinous material of the nucleus pulposus is replaced by a soft, white to yellow mass of amorphous calcified material, with no evidence of inflammatory reaction, neovascularization, or fibrous tissue change. The annulus fibrosus and cartilaginous end-plates are not affected.

Treatment

The natural course of this disorder is well-described, with 66% of patients becoming symptom-free within three weeks and 95% within six months². Cases have been reported in which symptoms and radiologic changes persist for as long as nine years, and in which different clinical courses took place in the same individual with multilevel calcification^{9,10}. There is no correlation between the duration of symptoms and the persistence of calcification, and it has been documented that disc calcification may occur both before or after the onset of symptoms^{5,8}.

The treatment is conservative. Analgesics, traction, and a cervical collar have been recommended. Rarely, posterior herniation causes nerve root or cord compression and surgical decompression is necessary⁵.

The prognosis is excellent for the majority of cases. Rarely, cases have been reported to have persistent symptoms and permanent radiographic changes, but recurrence is very unlikely^{8,9}. Secondary degenerative disc disease may result².

Differential diagnosis

The most important condition from which intervertebral disc calcification must be distinguished is discitis, due to its sequela of permanent joint deformity¹¹. The same age group of children is affected and the presenting symptoms are similar. In discitis,

however, the child is usually febrile and has an elevated ESR⁵. The radiographic presentation will help differentiate it from intervertebral disc calcification. Discitis causes narrowing of a single disc space with erosion of the vertebral end-plates rather than discal calcification. Other differentiating features are listed in Table 1.

Table 1. Differentiating features between intervertebral disc calcification and discitis. (Modified from Swick⁵)

	Calcification	Discitis
Etiology	unknown	infectious
Primary Site	C spine	L spine
Disc Involvement	single or multiple	single
Radiographs	calcification	decreased disc space
Histology	no inflammation	inflammation present
Prognosis	complete resolution	possible permanent deformity

Calcific retropharyngeal tendinitis must also be considered in the differential diagnosis of disc calcification. Usually preceded by minor trauma, it typically presents with neck stiffness and gradually increasing pain that is aggravated by swallowing and neck motion^{12,13}. The age of presentation is older, however, with all eighteen cases reported in the literature being in adults over the age of twenty. Also, the calcification is anterior to the vertebral body in the retropharyngeal soft-tissue space and not in the disc space.

Conclusion

Cervical intervertebral disc calcification is a rare cause of acute neck pain in children. The radiographic appearance of amorphous calcification within the nucleus pulposus is diagnostic and should be recognized. Once differentiated from the more serious condition of discitis, the child can be reassured that this is a benign, self-limited condition. In the majority of cases cervical disc calcification resolves with short-term conservative treatment.

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