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CASE REPORT

INTERVERTEBRAL DISC CALCIFICATION IN ELDERLY

ABSTRACT

Chondrocalcinosis or intervertebral disc calcification (IDC) denotes a deposition of hydroxyapatite or calcium pyrophosphate dihydrate crystals within annulus fibrosus and/or nucleus pulposus of the disc. The prevalence of IDC increases with age and extent of disc space loss. An 80-year-old female that was referred to us due to back pain complaint had diffuse calcification of the thoracic intervertebral discs on her plain x-rays (AP, lateral). In the light of laboratory and clinical tests results, the patient was diagnosed as a case of IDC and degenerative disc disease. Although IDC may accompany some systemic diseases and immobilization, it is probable that the main common factors are aging and degeneration of the intervertebral disc in elderly patients.

Key words: Intervertebral disc calcification, Chondrocalcinosis, Intervertebral disc degeneration.

OLGU SUNUMU

YAŞLIDA İNTERVERTEBRAL DİSK KALSİFİKASYONU

Öz

Kondrokalsinozis veya intervertebral disk kalsifikasyonu (İVDK) hidroksiapatit veya kalsiyum pirofosfat dihidrat kristallerinin diskin anulus fibrozus ve/veya nukleus pulposusunda birikmesidir. İVDK görülme sıklığı yaşla ve disk aralığının azalması ile artar. Sırt ağrısı yakınması ile kliniğimize gönderilen 80 yaşındaki kadın olgunun torakal (AP, lateral) radyografilerinde yaygın torasik İVDK mevcuttu. Klinik ve laboratuvar testler doğrultusunda olguya dejeneratif disk hastalığı ve İVDK tanısı konuldu. İVDK bazı sistemik hastalıklara ve immobilizasyona eşlik edebilmesine rağmen muhtemelen İVDK'lı yaşlı olgularda en yaygın etkenler, yaşlanma ve intervertebral disk dejenerasyonudur.

Anahtar sözcükler: Intervertebral disk kalsifikasyonu, Kondrokalsinozis, Intervertebral disk dejenerasyonu.

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INTRODUCTION

IDC or chondrocalcinosis denotes a deposition of hydroxyapatite or CPPD crystals within annulus fibrosus and/or nucleus pulposus of the disc. IDC has been associated with systemic conditions that result in biochemical alterations (e.g., alkaptonuria, hemochromatosis, CPPD crystal deposition disease, hyperparathyroidism, acromegaly, and amyloidosis) and conditions such as immobilization or fusion of the spine (e.g., poliomyelitis, ankylosing spondylitis, juvenile chronic arthritis, and vertebral fusion from surgery or local trauma) (1,2). In the present case report, an elderly patient with an intervertebral disc calcification was described, and the related literature was reviewed.

CASE REPORT

An 80-year-old female was referred to us due to back pain complaint. The patient who has back pain problem for two years, starts having worse complaints, especially in the last six months. She had no any other complain except asthma, for 20 years. The musculoskeletal exam demonstrated about 10° limitation of the cervical spine at extension and about 30° limitation of thoracic and lumbar spine at extension. Loss of normal lordotic curve (flattening) and thoracic kyphosis were remarkable.

Range of motion was painful in all planes. She had mild pain when palpated over the spine. Neurological examination was normal. Although there was no blue-black pigmentation inside the ear and the sclera we determined opacity in the cornea. The plain x-rays (AP, lateral) showed diffuse calcification of the thoracic intervertebral discs (Figure 1). No calcification was observed on lumbar and cervical spine and peripheral joint radiographs. Laboratory results were normal. A urine specimen was tested for the presence of homogentisic acid, but no positive results were observed. There was no evidence of any parathyroid abnormalities and, renal disease. The examination of the eye revealed the cause of the opacity in her cornea as cataract. After these clinical and laboratory evaluation, the patient was diagnosed as a case of IDC and degenerative disc disease, and the physical therapy and rehabilitation program was started. The patient received a treatment program for 4 weeks consisting of, infrared, transcutaneous electrical nerve stimulation, ultrasound and posture exercises. Significant decrease of pain was determined following this program. The examination which is performed after 6 months from the therapy did not show any change about patient's clinical status.

DISCUSSION

The prevalence of IDC in the general adult population has been previously reported as 5%–6% with conventional radiography (1,2) while radiographic inspection of cadavers ha-

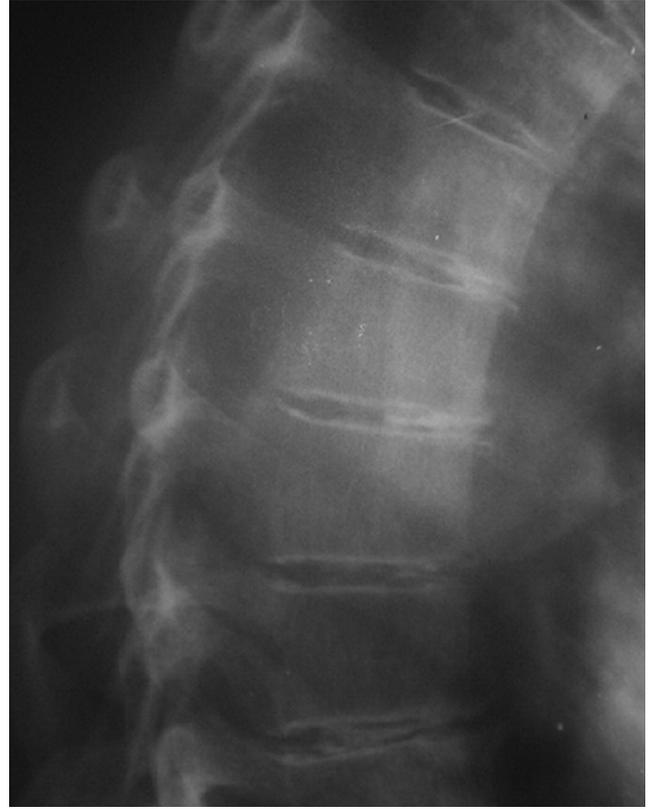


Figure 1— The thoracic lateral x-rays showed diffuse calcification of the thoracic intervertebral discs.

ve revealed a higher prevalence (3,4). High prevalence related to histological examination of disc materials which were surgically excised, are reported as well (5).

Chondrocalcinosis means the radiological or pathological presence of calcifications within joints or fibro cartilage. This is often caused by CPPD crystals, but may also be caused by other forms of calcification such as calcium hydroxyapatite, calcium oxalate. CPPD arthropathy includes structural alterations of joints with limited mobility due to cartilage degeneration.

Pseudogout refers to the clinical syndrome associated with CPPD crystals, which is characterized by red, tender, and swollen joints, and mimics gout (6). Although CPPD arthropathy mostly affects the; knee, wrist, shoulder, elbow, and hip joints of elderly women, it may affect intervertebral discs as well. Along with an overall affect on vertebrae, lumbar and cervical areas are the leading locations being affected (7,8)

There was no evidence of complications due to hemochromatosis, ochronosis, hyperparathyroidism, poliomyelitis, acromegaly, amyloidosis, fused spine or progressive pseudor-



heumatoid, dysplasia, which might have accompanied IDC. However, these diseases should be checked in cases of IDC.

Ochronosis is a musculoskeletal manifestation of alkaptonuria, an inherited metabolic disorder associated with various systemic abnormalities related to the deposition of homogentisic acid pigment in connective tissues. This deposition results in ochronotic pigmentation and arthropathy. Radiographic abnormalities of ochronotic arthropathy are found both within the spine and the extraspinal joints. In the spine, the progressive calcification and "vacuum" phenomenon of disc spaces are the most characteristic findings. Disc space narrowing is associated with calcification and marginal sclerosis of vertebral bodies. In extraspinal sites; space narrowing, bone sclerosis and fragmentation may also be observed. Diagnosis of ochronotic arthropathy is often suggested by radiographs of the spine, and it is confirmed afterwards by clinical and laboratory findings (9). In this case a urine specimen was tested for the presence of homogentisic acid, but no positive findings were observed.

Hemochromatosis is a rare disease caused by abnormal accumulation and deposition of iron in various tissues. The primary articular manifestations of the disease are characteristic symmetric, non-inflammatory, degenerative arthritis affecting the metacarpofalangeal joints (especially the 2nd and 3rd), and recurrent attacks of pseudogout secondary to CPPD crystals.

Calcification in intervertebral disc was also reported (10). In this case serum ferritin level was normal.

IDC may be observed in hyperparathyroidism. The accumulated crystal type here was CPPD (1) whereas in acromegaly calcium hydroxyapatite crystals were present. The IDC seen in this case was thought to occur as a result of the degeneration and regeneration processes within cartilage and bone tissues (1,11). IDC may be observed in cases with severe poliomyelitis. Even a radiologic result similar to ankylosing spondylitis may be present (1,12). IDC can be observed in immobile vertebral segments such as in patients manifesting ankylosing spondylitis, and surgical spine fusion as well. Fusion prevents the normal mechanical stresses within the disk, leading to premature degenerative changes and calcification of the nucleus pulposus (1,13). Juvenile IDC is characterized by calcification of the nucleus pulposus. Calcification may remain dormant or subsequently become symptomatic. The symptoms include fever, malaise, and neck pain and are associated with an elevated erythrocyte sedimentation rate and, occasionally leukocytosis. Juvenile intervertebral disc calcification is generally a self-limiting disease (14).

As a result of the detailed examination of our case, we didn't find any other biochemical change or condition that would lead to immobilization. However, the thoracic kyphosis was remarkable. Thoracic IDC was thought to occur as a result of the degeneration.

Potential pathogenesis courses include tearing of the annulus fibrosis due to severe degeneration of the disc, followed by an inflammatory response to nuclear material and phagocytic resorption of calcified material (15). Postmortem studies have shown that, IDC is common in elderly persons, especially in annulus fibrosus and lower thoracic spine. The prevalence of IDC was correlated with age and extent of disc space loss (3,4).

In conclusion, the mechanism of IDC is not clear. Although IDC may accompany some systemic diseases, immobilization of the spine and biochemical alteration it is probable that the main common factors are aging and degeneration of the intervertebral disc in elderly patients.

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