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# Patient With A Diagnosis Of Ochronosis After Lumbar Dyscectomy: Case Report

## Lumbar diskektomi sonrası okronozis tanısı alan hasta: Olgu sunumu

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**SUMMARY**
Ochronosis is the black discoloration of connective tissues seen with alkaptonuria, a metabolic disorder. Alkaptonuria is a rare autosomal recessive metabolic disorder caused by the lack of homogentisic acid oxidase enzyme. Alkaptonuria causes degenerative changes in cartilage, intervertebral disc and other tissues. The patients operated due to lumbar disc herniation in alkatonuria are very few. In this article a case of ochronosis in which the patient was determined after lumbar discectomy is presented.
**Keywords**: Okronozis, Homogentisik asit oksidaz, Lomber diskektomi

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**ÖZET**
Okronozis, metabolik bir bozukluk olan alkaptonüride görülen bağ dokularının siyah renkli değişikliğidir. Alkaptonüri; homogentisik asit oksidaz enzim eksikliğine bağlı gelişen nadir görülen otozomal resesif metabolik bir hastalıktır. Alkaptonüri kıkırdak dokuda, intervertebral disklerde ve diğer dokularda dejeneratif değişikliklere neden olur. Alkaptonüride lomber disk hernisi nedeniyle opere edilen hasta sayısı oldukça azdır. Bu makalede lomber diskektomi sonrası okronozis saptanan sunulmuştur.
**Anahtar sözcükler:** Okronozis, Homogentisik asit oksidaz, Lomber diskektomi

## INTRODUCTION

Alkaptonuria is a rare autosomal recessive metabolic disease resulting from an enzyme deficiency in tyrosine metabolism. Alkaptonuria is characterized by accumulation of homogentisic acid (HGA) in tissues and excretion in urine [1]. Ochronosis is brown-black pigmentation as a

resulting of the accumulation of HGA and its metabolites in connevtive tissues such as eyes, ears, skin and tendons [2].

Ochronosis usually seen in adults and isn't clinically evident until the age of 30. Peak incidence is in the fifth decade. In patients, spine and joint complaints emerge with increasing age [3].

Diagnosis is usually made with degenerative arthritis, ochronotic pigmentation and urine color turning black as a result of alkalization [4]. HGA measurement by chromatographic methods in urine is the gold standard for the diagnosis of ochronosis [5]. Palliative treatment are generally used in ochronosis or replacement surgery is applied to the affected joint [6].

## CASE REPORT

A 46 year old female patient with left leg pain that unresponsive to drug therapy was admitted to the neurosurgery clinic. Physical examination findings were 50 meters neurogenic claudication, left laseque test positivity and hypoesthetic left L5 dermatome. Her motor deficit wasn't present. She didn't have any drug use and chronic disease history.

In the patient's cervical thoracic and lumbar anteroposterior and lateral radiographs, was found to be thoracic kyphosis increased and lordosis decreased. Diffuse disc calcification was observed in the middle, lower thoracic and lumbar discs. In addition, sclerosis was increased in the end plates of these vertebrae and there were osteophytes in some areas. The patient was operated with a prediagnosis of left L4-5/L5-S1 lumbar disc herniation.

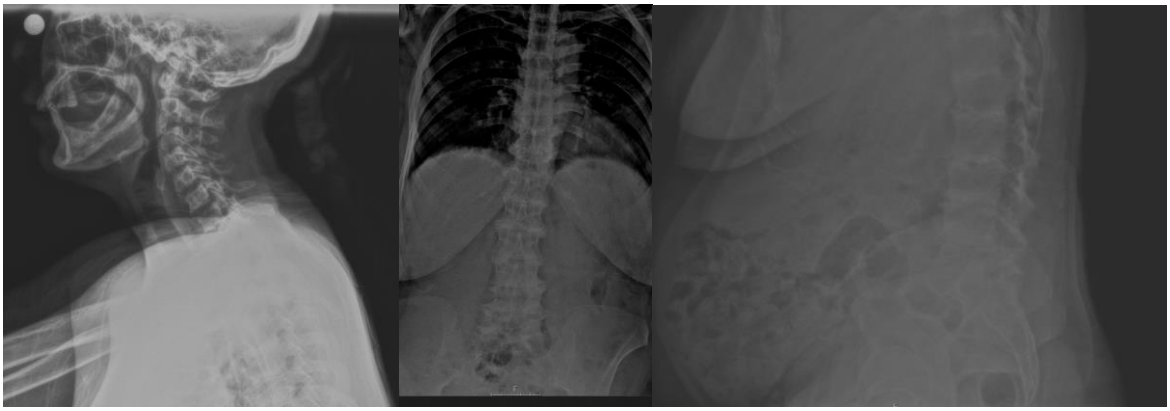

**Figure 1-3:** Cervical, thoracic and lumbar graphy images of the patient.

During the surgery, hard and black colored tissues in L4-5 disc range were observed and the material was sent to the pathology laboratory for histopathological examination.

On macroscopic examination in the pathology laboratory, irregularly shaped fragments with gray-white colored areas of brown-black were seen. On microscopic examination, fibrocartilaginous tissue fragments containing black pigment and foreign body reaction were observed. Metallose was considered in the differential diagnosis. However, this diagnosis was excluded because the patient hadn't previous history of surgery and disease. With clinical, radiological and histopathological findings, ochronosis was considered in the case, it was recommended that the patient be evaluated in terms of alkaptonuria disease.

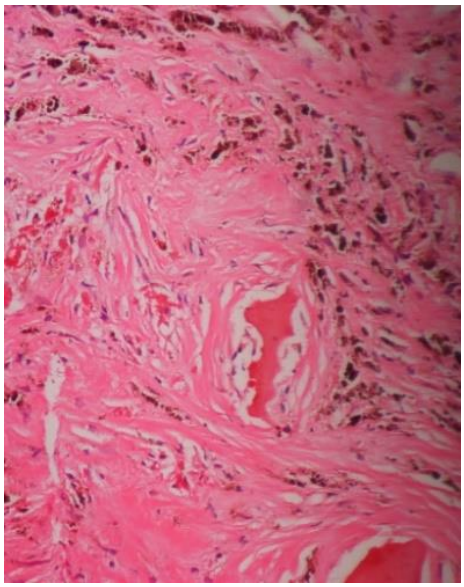

**Figure 4:** Microskopic view of the tissue excised from the lumbar region with surgery. Brown-black pigmentation was seen (x40,H&E).

After histopathological examination, in the detailed physical examination performed of the patient, who didn't have a family history of alkaptonuria, no other observation of alkaptonuria was observed.

She was referred to the endocrine clinic for genetic analysis of alkaptonuria and was discharged in the optimum shortest time after surgery due to the COVİD-19 pandemic situation.

## DISCUSSION

Alkaptonuria with a frequency of 1/250000 is a rare autosomal recessive rare metabolic disease of phenylalanine and tyrosine metabolism. It is seen as a result of the deficiency of the homogentisate 1,2 dioxygenase (HGD) enzyme, which converts HGA to maleyl acetoacetate. In ochronosis, HGA accumulation occurs as a result of HGD deficiency. Ochronotic pigment accumulates in the connective tissues and causes loss of function in many body systems. Ochronosis is usually asymptomatic until adulthood [7].

The characteristic feature of ochronosis in adults is that it causes serious damage to the load bearing joints such as the spine, coxa and knee [8]. Flattening of lumbar lordosis, decrease in spinal mobility, narrowing of intervertebral disc space and calcification of discs are observed. Intervertebral disc calcification is a condition that occurs in many diseases other than ochronosis [9]. In this case, thoracic kyphosis increased and lumbar lordosis decreased. Diffuse disc calcification, which is also common in ochronosis, was observed in the discs of the middle thoracic, lower thoracic and lumbar regions. In these vertebrae, sclerosis was increased in the end plates and there were osteophytes. Calcification wasn't observed in the discs in the cervical region. In ochronosis, the lumbar region is mostly affected, followed by the thoracic and cervical region [10].

The accumulation of HGA in cartilage tissue weakens collagen and causes tissue destruction. Disc herniations can be seen as a result of disc degeneration in intervertebral disc involvement. Although very rare, cases diagnosed with alkaptonuria following lumbar discectomy material, such as this case, have been reported [11]. In addition, it has been reported that lumbar discectomy is beneficial in patients with lumbar involvement [6].

On microscopic examination in the joint involvement of ochronosis, intracytoplasmic pigmentation is seen in the cartilage tissue. Secondary connective tissue changes to degeneration accompanying pigmentation and nonspecific inflammatory infiltration may also be seen. On the microscopic examination of this case, Brown-black pigmentation and foreign body reaction are observed. Hemachromatosis and amyloidosis are also diseases that can cause disc calcification. These two diagnoses were excluded because the pigmentation observed in this case didn't coincide with the pigment features of these

diseases [12]. The case was evaluated as ochronosis with its clinical, radiological and histopathological features.

There isn't a specific treatment for alkaptonuria. Firstly, palliative treatments are used. Diet can be beneficial, especially in young patients. Surgical approach is suggested for joint involvement with increasing age [13].

**In conclusion**, alkaptonuria is a rare metabolic disease that is included in the differential diagnosis of patients presenting with symptoms of intervertebral disc herniation and with diffuse disc calcifications. Especially, brown black pigmentation observed in tissues during the surgery and microscopic examination should be a alerting for ochronosis. Early diagnosis is important to prevent progression of the disease.

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