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PATHOMORPHOLOGICAL CHANGES OF ELASTIC, FIBROSIS MEMBRANE AND VERBAL BONES IN SCHMORL'S HERNIA.

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ABSTRACT

The article examines Schmorl's hernia and its effect on the properties of the spinal canal, among the changes that can occur in degenerative diseases of the lumbar spine. In 26 patients with degenerative diseases of the spine, the changes of the spinal cord, disc and spinal cord caused by Schmorl's hernia were studied on the basis of pathomorphological examinations.

Material and examination methods: 26 patients with degenerative lumbar spine diseases were diagnosed with Schmorl's hernia as a result of CT and MRI examinations. Pathomorphological examinations of the degenerated togai plates and disc bulgings obtained during the operation were carried out and the following results were obtained.

Taking into account the mechanism of origin of Schmorl's hernia, first the porous part of the vertebral bone, then the fibrous membrane covering the articular surface and the fibrous membrane of the vertebral disc, and then the herniated tissue that penetrated into the spongy part of the bone were studied microscopically. Based on the mechanism of development of pathomorphological changes in these tissues, specific aspects of processes such as dystrophic, destructive and necrobiotic changes in tissue structures, it was planned to carry out the procedure without additional damage to the patient's spine during the surgical treatment of this disease.

Porous part of the spine. Taking into account the damage of the spongy part of the spine in Schmorl's hernia, we first studied the pathomorphological changes developed in this bone. Histologically, the spongy part of the bone consists of spongy (Latin -substantia spongiosa) structure, between the pores there are solid bone columns. Compared to compact bony columns, the spongy part takes up a lot of space and gives the bone lightness, low density and durability, and is bone marrow. The spongy part of this bone has a structure similar to the epiphysis of tubular bones. Compact bony columns are arranged irregularly, giving the bone strength and durability.

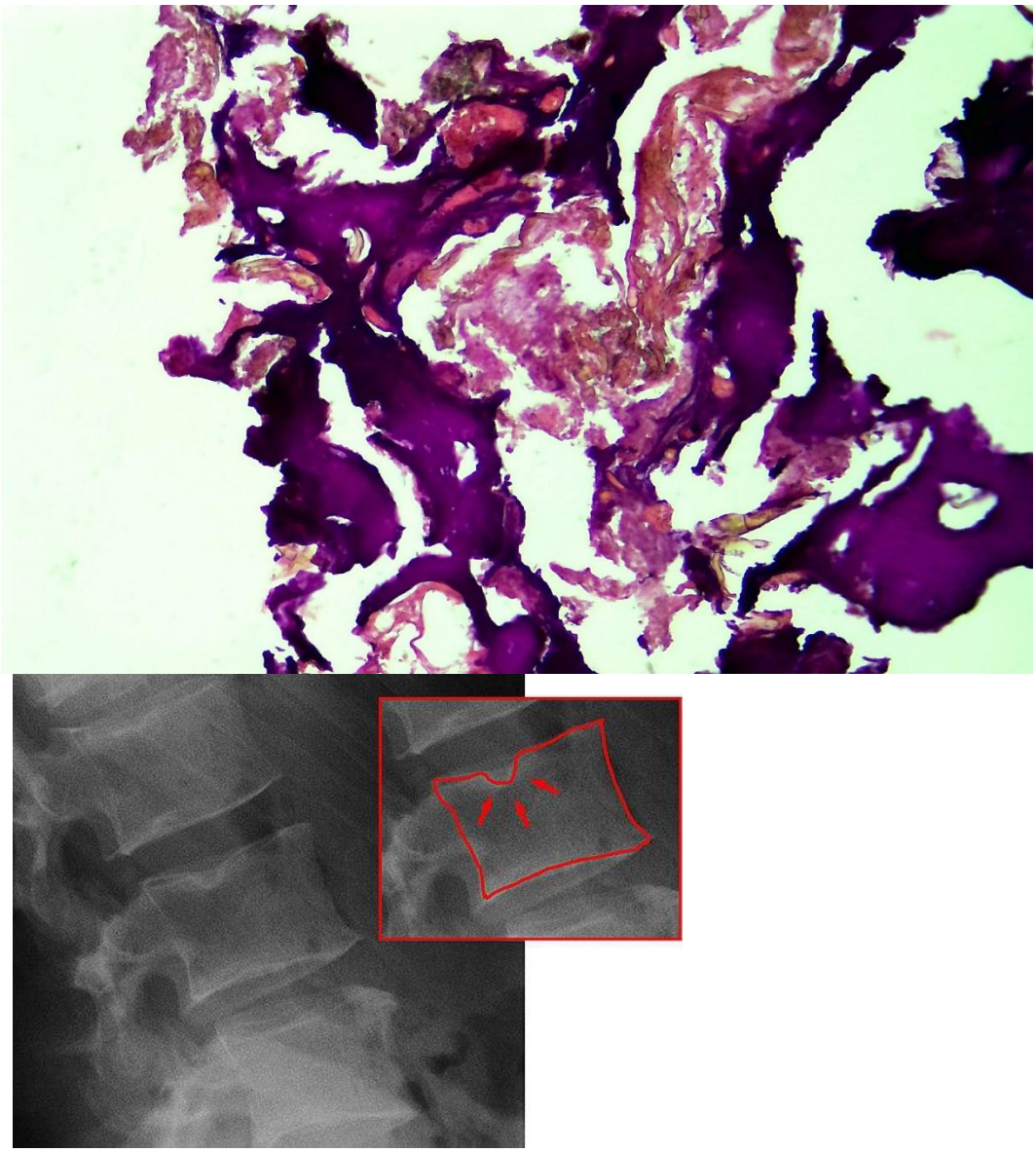


Figure 4.1.1. Schmorl's hernia. The spongy part of the vertebral column is destroyed, hemorrhages in the spongy spaces, and sclerosis develops. Paint: G-E. Floor: 10x10.

People suffering from Schmorl's hernia developed a number of general pathomorphological changes in the vertebral column, including strong and irreversible dystrophic and destructive changes in compact bone columns (Fig. 4.1.1). Dystrophic changes are observed in the formation of fibrotic dysplasia and foci of calcinosis in the bone columns. As a result, it is determined that the bone pillars have lost their histotopography and entered a structureless state. In this case, it is observed that the compact bone is incorrectly stained with hematoxylin-eosin dyes, and hematoxylin foci predominate in most places. It is known that calcium salts are accumulated a lot and calcinosis has developed in areas that have received a large amount of hematoxylin dye in the bone tissue. When studying the vertebral part of the spine, it was found that the bone pore spaces were filled with bone marrow cells, instead of them, they were filled with blood clots, carbohydrate and protein substance, bundles of connective tissue and foci of calcinosis. In some cases, fibrotic and lipomatous dysplasia is detected in the spongy part of the bone. In this case, it is determined that the compact bone columns are further deformed, broken in some places, and

fibrous tissue has grown. Instead of the normal bone marrow in the pore spaces of the bone, it is determined that fibrous connective tissue tufts and adipose tissue grow and multiply (Fig. 4.1.2). Microscopic examination of the compact columns of the spongy part of the vertebral bone revealed that protein collagen fibers decreased in the bone structure, and it was stained darker by hematoxylin dye due to an increase in calcinous substances. It is determined that a layer with hematoxylin has appeared, especially in the outer parts of the bone. Small- and large-sized vacuolation centers are found everywhere in the compact bone (Fig. 4.1.3).

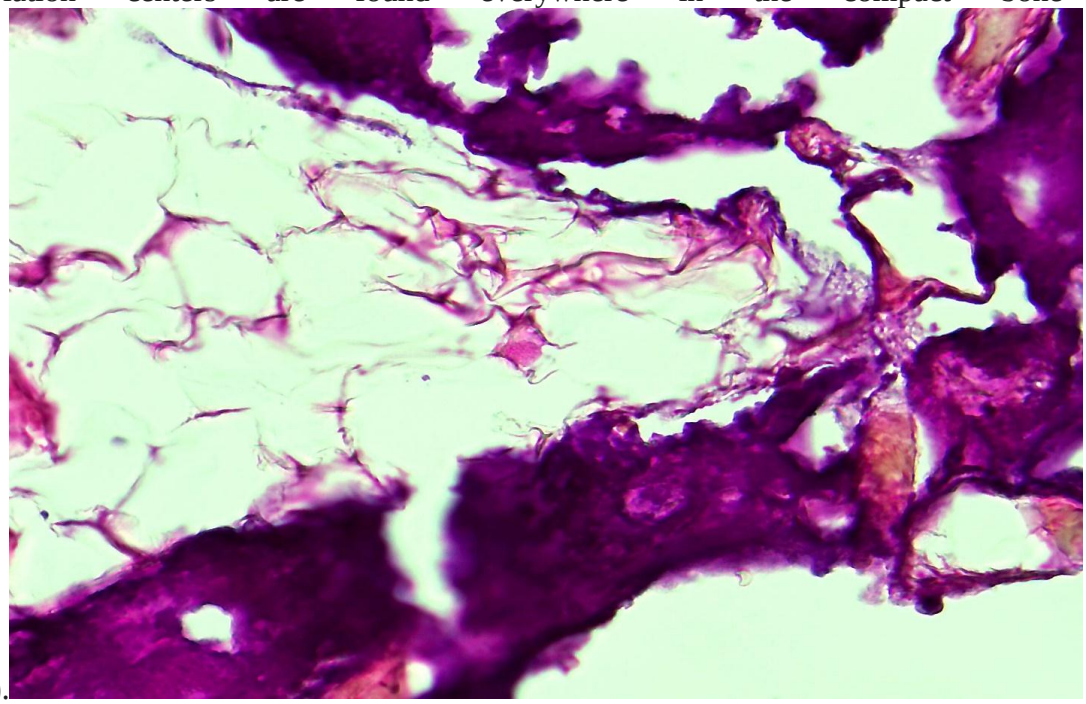


Figure 4.1.2. Schmorl's hernia. The appearance of fibrosis and lipomatous tissue in the pores of the bone. Paint: G-E. Floor: 10x40.

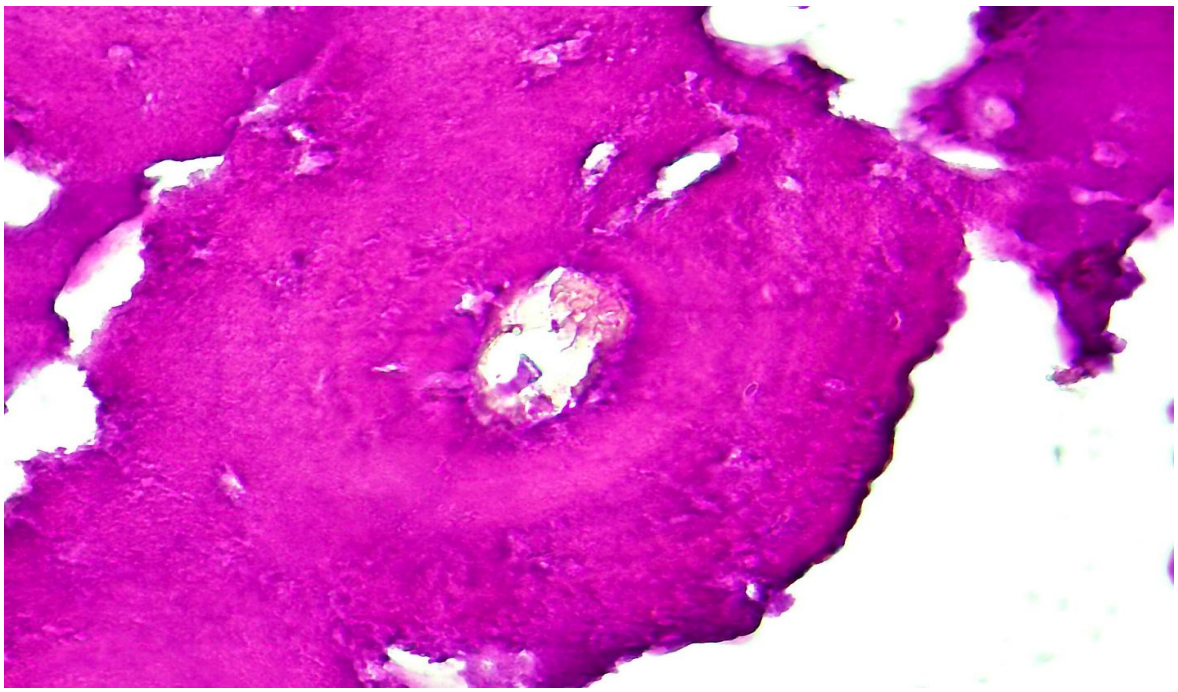
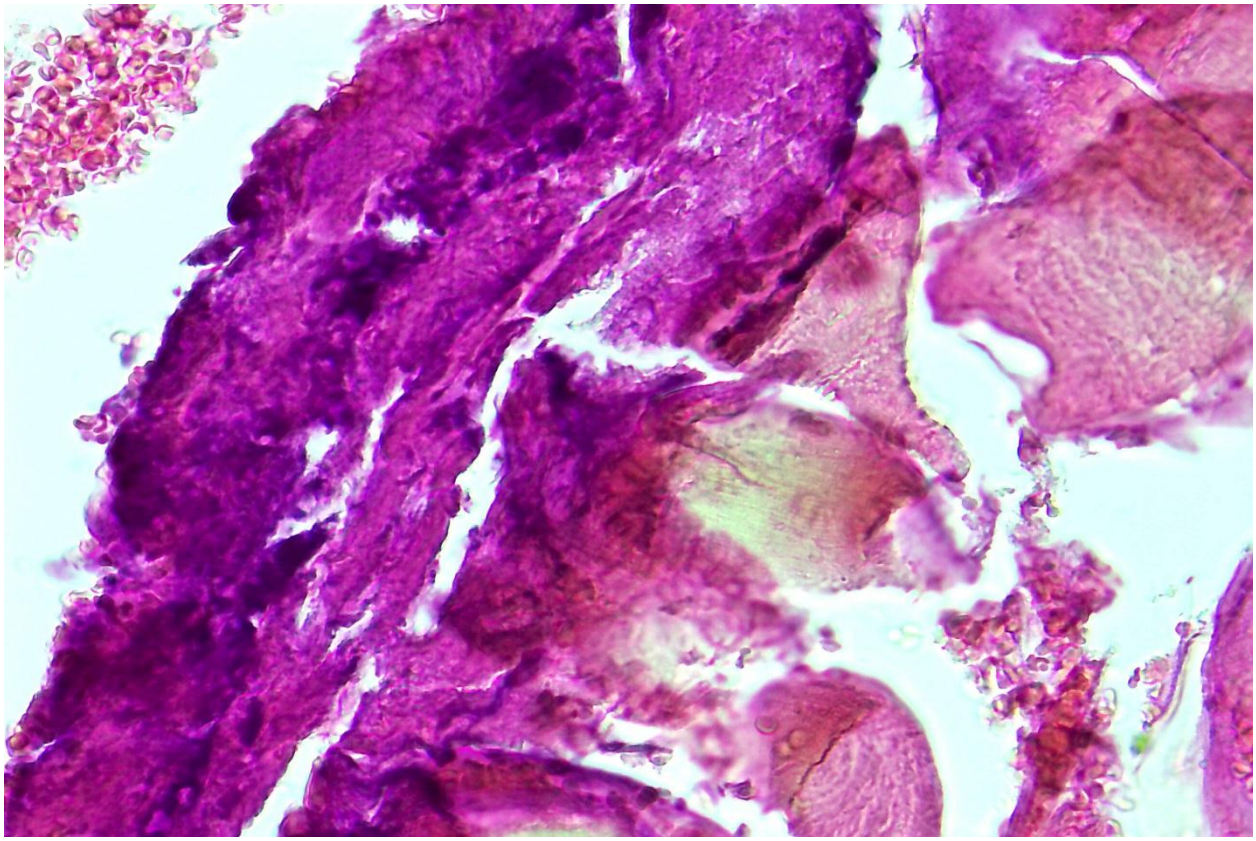


Figure 4.1.3. Schmorl's hernia. Formation of foci of calcinosis and vacuolization in compact columns. Paint: G-E. Floor: 10x40.

Figure 4.1.4. Schmorl's hernia. Development of elastic membrane, dystrophy, calcinosis and destruction. Paint: G-E. Floor: 10x40.

The elastic fibrous membrane covering the spongy part of the spine from the side of the vertebral disc was studied microscopically during Schmorl's hernia, and the following pathomorphological changes were determined. Due to the development of dystrophic, calcinous and destructive changes in the structure of the elastic membrane, it is determined that it is histologically chaotic and stained to different degrees. It is observed that the fibrous structures of the curtain are fragmented and destroyed, chaotically located, and breaks appear in separate places. It is determined that the surface of the membrane adjacent to the bone is separated, a gap has appeared between them, and the process of calcinosis with multiple and large foci has developed in the structure of the membrane. When the elastic fibers in the elastic curtain are stained by the Weigert method, it is determined that the elastic fibers in all areas of the curtain are reduced in quantity, disintegrate, lose their elasticity, and turn into a coarse dispersed substance in a homogeneous state (Fig. 4.1.5). It is observed that on the outer surface of the curtain, an unevenly located layer of relatively dark colored elastic fibers has appeared. In the inner part of the membrane, vacuolated foci of various sizes are found among the broken elastic fibers.

In Schmorl's hernia, when a cavity appears in the spongy part of the spine, the fibrous membrane stretches and expands due to the increase in pressure with the contents of the vertebral disc, its fibrous structures become thinner and rupture, and the elastic fibrous membrane under it also expands under the influence of pressure, breaks its elasticity, as a result, it also cracks, and the spongy material sinks into the spongy bone. . Morphologically, it can be seen that the structure



of the herniated disc has changed, it has broken through the fibrous membrane, and the spongy bone has penetrated through the ruptured elastic fibrous membrane (Fig. 4.1.6). As a result, the compact columns of cancellous bone crack and disintegrate, and it is determined that spongy tissue has penetrated into the porous spaces. During the development of this process,

microscopic examination of the fibrous membrane of the herniated disc revealed the following changes, i.e., it was determined that the fibrous structures contained in the fibrous membrane were thinned, thinned due to swelling, most of them disintegrated and homogenized, and a substance with a coarse composition appeared (Fig. 4.1.7).

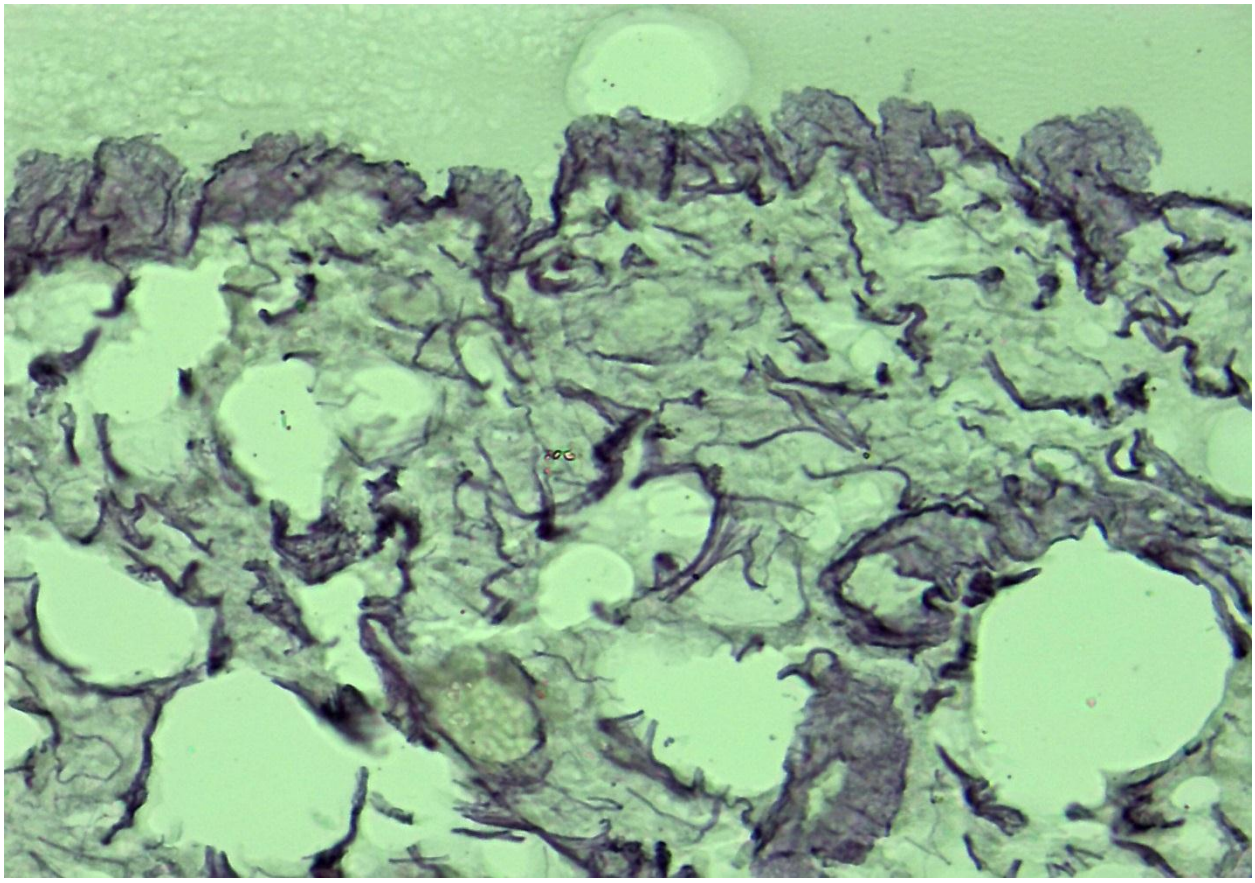


Figure 4.1.5. Schmorl's hernia. Breakdown and destruction of elastic fibers in the elastic membrane. Dye: Weigert's method. Floor: 10x40.

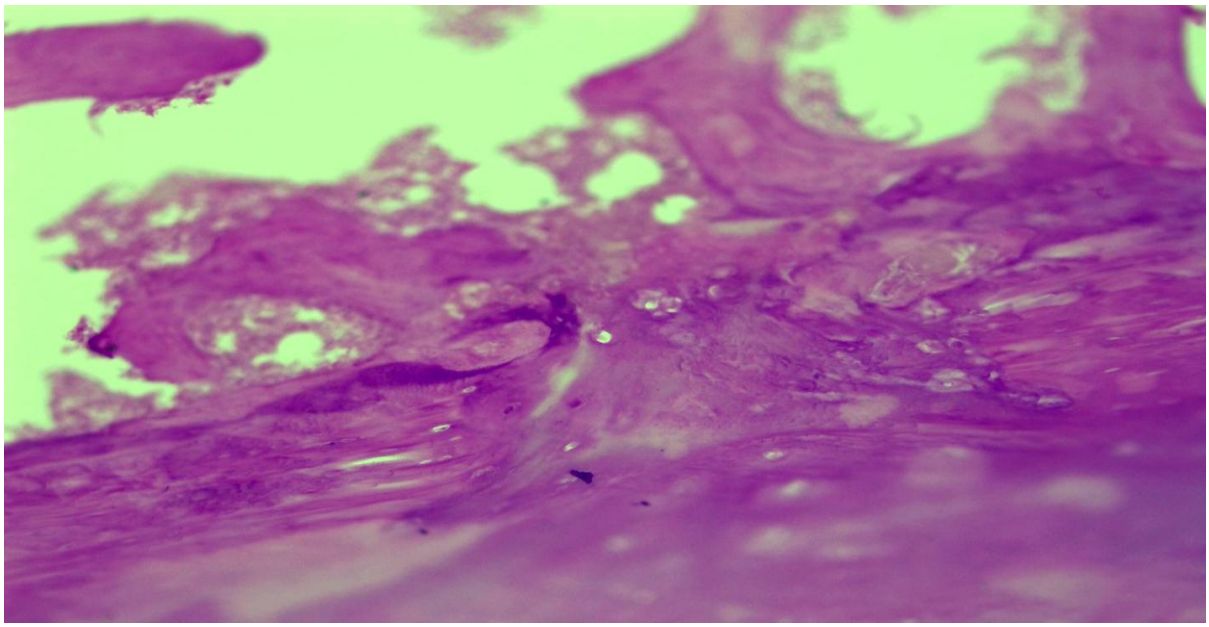


Figure 4.1.6. Schmorl's hernia. The penetration of spongy tissue into the cancellous bone by breaking through the fibrous and elastic membrane. Paint: G-E. Floor: 10x40.

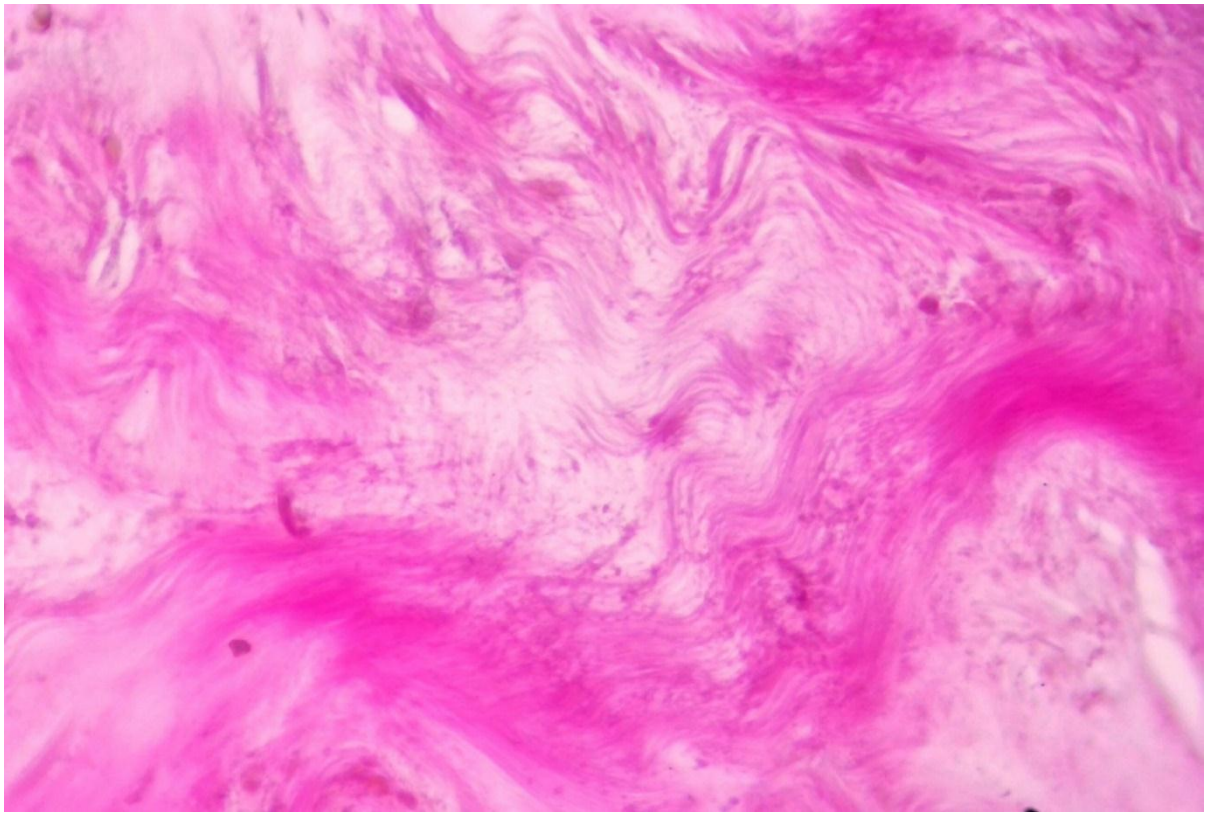


Figure 4.1.7. Schmorl's hernia. Fibrous membrane of the lumbar disc, swelling, disintegration and homogenization of fibrous structures. Paint: G-E. Floor: 10x40.

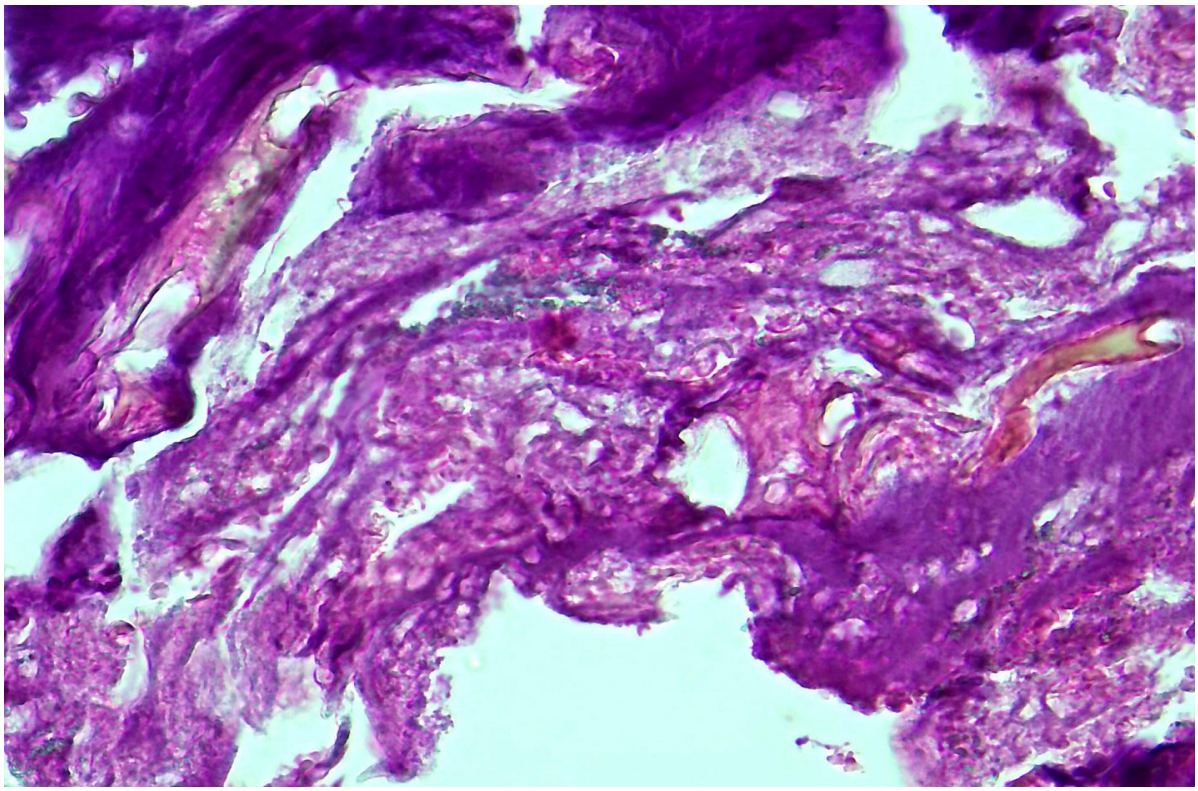


Figure 4.1.8. Schmorl's hernia. The composition of spongy tissue embedded in cancellous bone, fragmented, destroyed spongy and fibrous tissue and calcinosis. Paint: G-E. Floor: 10x40.

In Schmorl's hernia, when the spongy tissue embedded in the spongy bone is examined microscopically, it is determined that the spongy substance in it is destroyed, fragmented, dystrophic and calcinosis (Fig. 4.1.8). Among them, it is determined that there are foci of hemorrhage, fibrous structures. It is observed that fibrous fibrous tissue bundles are also present together with thick tissue, they are also destroyed and fragmented.

Conclusion.

1. The cause of Schmorl's hernia is that the soft tissues of the spine develop rapidly as a result of the rapid growth of the body during the youth, the bone tissue lags behind the growth, and a gap appears in the spongy part of the bone, and the membrane covering the joint surface of the spine sinks into the spongy part of the bone over time.
2. It is determined that strong and irreversible dystrophic and destructive changes have developed in the compact bone trabeculae in the porous part of the spine, fibrous dysplasia and calcinosis have appeared in the structure, and the bone columns have lost their histotopography and entered a structureless state.
3. Instead of normal bone marrow cells, blood clots, carbohydrate and protein substance, connective tissue tufts and calcinosis, and in some cases complete lipomatosis are found in the cystic bone pores.
4. It is observed that in the elastic fibrous membrane that covers the spongy bone, the elastic fibers break down and become homogenized, coarse protein is formed, and the interstitial substance becomes vacuolated and disintegrated.

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