SYNOVIAL TISSUE TUMORS

ESSAY

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BY

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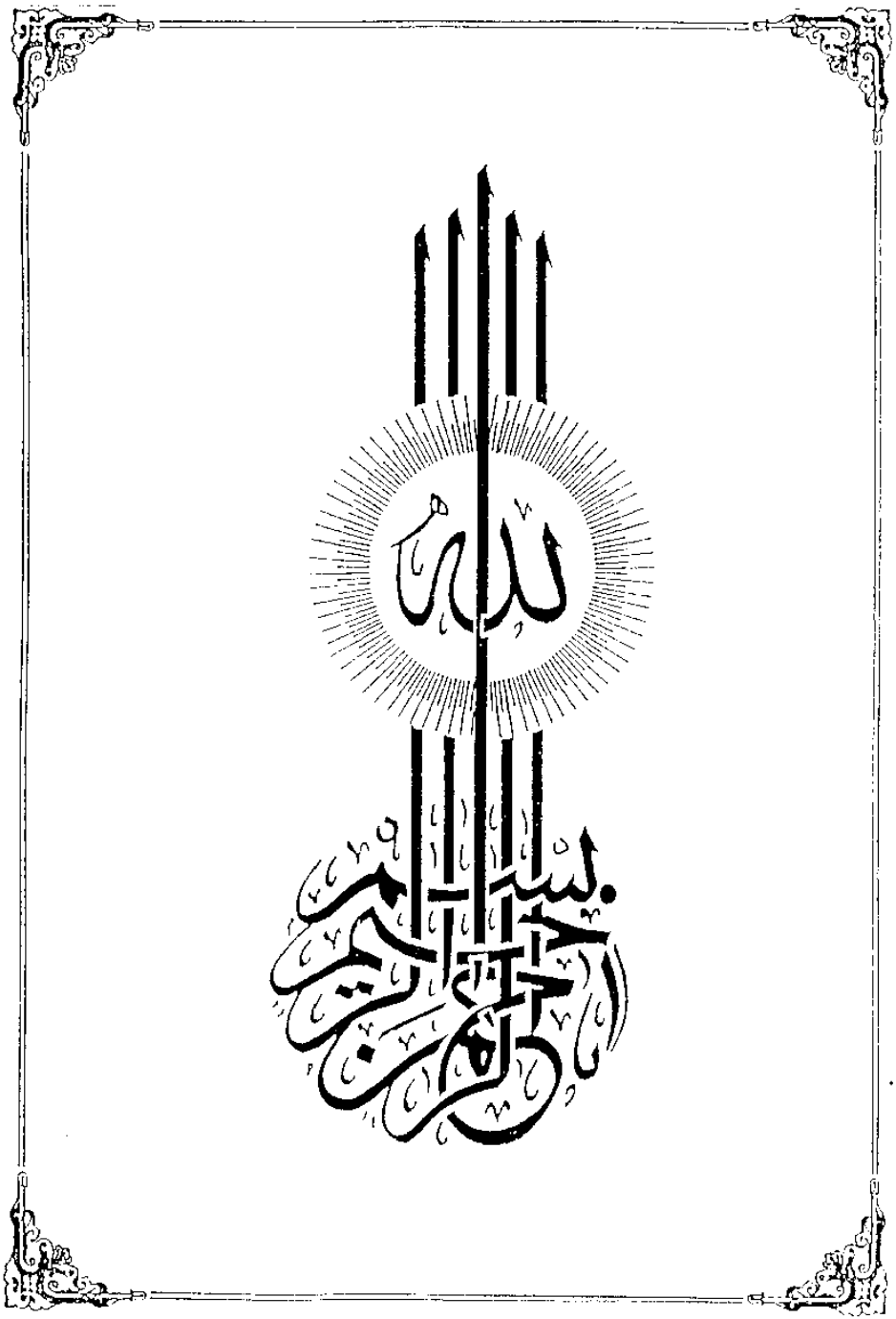

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INTRODUCTION

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Synovial tissue is a modified connective tissue that is formed from a development of cavities in a preexisting mesendryme. The progenator mesenchyme differentiates into two recognizable components: an inner "epithelioid " cell layer and an outer, also specialized connective tissue layer. Committed cells from these two compartments posses properties that distinguish them from other offspring of mesenchyme and while the cells may appear as separate entities, they are considered interchangeable.(9)

The synovial membrane varies considerably in appearance, depending on local mechanical factors and the nature of the underlying tissue. For instance, the synovial surface of joints subjected to high pressure is flat and acellular, whereas joints under less stress have a redundant surface lined by cells that resemble cuboidal or columnar epithelium.(28). Unlike epithelial lining cells, the synovial cells do not rest on a basal lamina but blend with the underlying stromal elements.

By elecron microscopy; the synovial membrane is composed of two cell types: Type A cells are found close to the articular surface and are characterized by long filopodia which extend upward and form a ramifying network of overlaping processes devoid of junctional attachment.(5) In addition type A cells have prominant Golgi apparatus, numerous vacuoles containing granular material, mitochondria and pinocytotic vesicles . Type B cells lie deeper than type A cells and are reminiscent of fibroblasts in their ultra-structural profiles. They lack elaborate cytoplasmic processes and instead have a well-developed rough endoplasmic reticulum .(20)

CLASSIFICATION

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Synovial tissue tumors are classified into :-

I - TUMOR-LIKE LESIONS :

- Ganglion.
- Osteochondromatosis synovii.
- Localized giant cell tumor of tendon sheath .
- Diffuse giant cell tumor of tendon sheath or pigmented villonodular synovitis.

II- TRUE TUMORS :-

A] Benign

- Hemangioma.
- Lipoma .
- Synovial chondroma.
- Fibroma.

B] Malignant

- Synovial sarcoma .

In veiw of their close pathological relationship, it appears logic, as well as expedient, to consider the lining of synovial joints, bursae, and tendon sheaths as a single unit for the purpose of discussing tumors and tumor-like lesions.

One finds a number of lesions broadly classified as tumors that are not true neoplasms or whose pathological interpretation is debatable.

GANGLION , developing as it does through myxoid degeneration and cystic softening of connective tissue of joint capsule or tendon sheath,constitutes a tumor only in the limited clinical sense of swelling.

SYNOVIAL , BURSAL OR TENOSYNOVIAL OSTEOCHONDROMATOSIS, may be convincingly interpreted as a self-limited metaplastic process rather than a genuine expression of neoplasia,as will be indicated presently.

GIANT CELL TUMOR may well represent peculiar hyperplastic granulomas of as yet undetermined etiology, rather than true neoplasm.

The benign tumors that are encountered occasionally on the lining surfaces of articular capsules and tendon sheaths are mainly of the nature of LIPOMAS and HEMANGIOMAS, derived from the supporting fatty connective tissue and its blood vessels. FIBROMA and CHONDROMA are also listed in some classifications.

The only primary malignant neoplasm of clinical importance is SYNOVIAL SARCOMA.

MALIGNANT HEMANGIOENDOTHELIOMA, LIPOSARCOMA, FIBROSARCOMA, and CHONDROSARCOMA are theoretically possible. Secondary malignant neoplasms may extend into an articular capsule from a contaguous bone site, such as osteogenic sarcoma, chondrosarcoma and reticulum-cell sarcoma.(28)

TUMOR LIKE LESIONS OF SYNOVIAL TISSUE

TUMOR-LIKE LESIONS OF SYNOVIAL TISSUE

GANGLION

Ganglion is defined as a cystic swelling closely connected to joint or tendon sheath, It contains mucinous material. (32)

Etiology and pathogenesis:-

Conflicting views have been put forward on the origin of ganglia. Some believe that they represent a degenerative process as they may be the result of myxoid degeneration. Others claim that they are benign tumor of tendon sheath or joint capsule.

Gross findings :-

The ganglion is usually unilocular or multilocular. An accessory cyst may also be present. It is intimately attached to the tendon sheath at its base.

Microscopic findings :

The main cyst may be single or multiloculated . It appears smooth,wide and translucent. The wall is made up of compressed collagen fibres and is sparsely lined with flatened cells without evidence of epithelial or synovial lining.

Ultrastructural findings :

Electron microscopy further confirms the above findings. The capsular attachment of the main cyst reveals mucin-field" clefts" which have been shown by serial sections to intercommunicate, thereby,forming a tortuous

continuous duct connecting the main cyst with the adjacent underlying joint. The contents of the cyst are characterized by a highly viscous, clear, sticky, jelly-like mucin made up of glucosamine, albumin, globulin and a high content of hyaluroinc acid.(37)

Clinical findings :

Ganglia are commonest at the dorsum of the wrist , as well as the dorsum of the foot and around the ankle joint. They also occur less commonly, at the front of the wrist, or in the palm or fingers.

Ordinarily, there are no symptoms other than the patient may present with the swelling itself that often fluctuates in size and sometimes, discomfort and slight pain .

On examination, the swelling may be soft and obviously cystic but more often it is tense. It is often mistaken for a bony prominance but careful tests will show that it is flactuant. (2)(8)

Complications :

A ganglion arising deeply in the wrist or palm may interfere mechanically with the ulnar or median nerve or their branches. There will be motor and usually sensory impairment in the distribution of the peculiar branch affected.(2)

Treatment :

A ganglion should be removed if it is symptomatic or aesthetically displeasing, or when it occasionally compress an adjacent nerve as ulnar nerve in the canal of Guyon.

The treatment may be one of the following :

[1] **Direct pressure** :

Ganglion on the dorsum of the wrist may be ruptured by digital pressure, or by stricking the flexed wrist by a book. This particularly appropiate for young people when a surgical scar is objectionable .

[2] **Aspiration and injection :**

Aspiration and injection of hyaluronidase, sclerosing solutions, or cortson.

[3] **Multiple punctures** :

Ganglia of flexor tendon sheaths of digits are frequently cured by multiple puncture with an 18- guage needle under local anaesthesia. Needle rupture is not possible for ganglia on the radial aspect of the volar side of the wrist,because frequently, the radial artery is intimately associated with the ganglia.

[4] **Surgical excision** :

Surgical excision of a ganglion should include the removal of a generous margin about its base, often a part of a joint capsule. A few clusters of small ganglia may be seen that later may mature if not removed.(3)

OSTEOCHONDROMATOSIS SYNOVII

It appears to be compelling reason to regard this lesion as neoplastic and there is no knowledge of any instance in which malignant change actually insued . The condition is a self-limited metaplastic process

analogous to myositis ossificans . In fact, spontaneous arrest and regression have been noted clinically by a number of observers which is scarcely the behaviour one would expect of a neoplasm .(16)(31)

This condition is featured by the formation of numerous chondral and osseous bodies within the lining and sublining connective tissue of the affected structure . It is encountered for more often in joint capsules than in bursae or tendon sheaths, and the knee joint is its commonest site, although a hip, an elbow, or some other joints are involved.

Gross findings :

One may observe (on surgical exploration in the course of synovectomy) that the synovial lining of the joint proper, and perhaps of the suprapatellar pouch and posterior compartment as well, is studded by innumerable, small, firm, flat or slightly raised, grey yellow nodules. These have a tendency to become extruded so that the joint may contain numerous sometimes, hunderds of free chondral bodies.

Microscopic findings

On microscopic examination of the lining of an affected joint,one observes numerous foci of cartilagenous and/or osseous metaplasia in varing stages of development. The cartilage foci, as noted, may become calcified or converted to bone. At such sites there is initially focal nodular condensation of connective tissue cells, but the synovial lining elsewhere shows no characteristic alteration.(28)

Clinical findings :

Loose bodies do not necessarily cause symptoms, unless they become

jammed between the joint surfaces. In that event the characteristic feature is sudden and usually momentary locking of the joint. Locking of the affected joint usually accociated with sharp pain. The joint is usually unlocked after an interval, either spontaneously or by the patient manoeuvres. Several hours later the joint swells. The symptoms subside within a few days, but repeated attacks are to be expected. In many cases the patient is able to feel the mobile body through the soft tissues when it lies in a superficial part of the joint.

On examination, in the stage of swelling, the joint is distended with a clear, pale, straw-colored effusion. The patient is seldom seen when the joint is locked . Between attacks, there may be no objective signs other than perhaps slight wasting of the muscles around the joint. Sometimes, the loose body may be palpated. (2)

Roentgenographic findings :

Roentgenograms usually show multiple loose bodies and this depends upon whether they show sufficient calcification or osseous transformation to be radioopaque.

Treatment

When loose bodies cause trouble, it should be removed, when possible by an arthroscopic technique. If there are no symptoms of locking, operation is not essential. The removal of loose bodies may be combined with subtotal synovectomy. (2)