Issue №11

Part 3

International periodic scientific journal

ONLINE

www.sworldjournal.com

D.A.Tsenov Academy of Economics - Svishtov (Bulgaria)

Indexed in
INDEXCOPERNICUS
(ICV: 82.07)

SWorld Journal

Issue №11
Part 3
January 2022

Published by:
SWorld & D.A. Tsenov Academy of Economics, Svishtov,Bulgaria

ISSN 2663-5712
DOI: 10.30888/2663-5712

UDC 08
LBC 94

The International Scientific Periodical Journal "SWorldJournal" has gained considerable recognition among domestic and foreign researchers and scholars.

Journal Established in 2018. Periodicity of publication: twice a year

The journal activity is driven by the following objectives:

- Broadcasting young researchers and scholars outcomes to wide scientific audience
- Fostering knowledge exchange in scientific community
- Promotion of the unification in scientific approach
- Creation of basis for innovation and new scientific approaches as well as discoveries in unknown domains

The journal purposefully acquaints the reader with the original research of authors in various fields of science, the best examples of scientific journalism.

Publications of the journal are intended for a wide readership - all those who love science. The materials published in the journal reflect current problems and affect the interests of the entire public.

Each article in the journal includes general information in English.

The journal is registered in the INDEXCOPERNICUS, GoogleScholar.

UDC 08
LBC 94
DOI: 10.30888/2663-5712.2022-11-03

Published by:
SWorld &
D.A. Tsenov Academy of Economics
Svishtov, Bulgaria
e-mail: editor@sworldjournal.com

https://www.sworldjournal.com/index.php/swj/article/view/swj11-03-047
DOI: 10.30888/2663-5712.2022-11-03-047

УДК : 611.727.1/.2.013

TOPOGRAPHIC AND ANATOMICAL FEATURES OF THE ONTOGENESIS OF THE LIGAMENTS APPARATUS AND CAPSULES OF THE SHOULDER JOINT

ТОПОГРАФО-АНАТОМІЧНІ ОСОБЛИВОСТІ ОНТОГЕНЕЗУ ЗВ'ЯЗКОВОГО АПАРАТУ ТА КАПСУЛИ ПЛЕЧОВОГО СУГЛОБА

Rusnak V.F./ Руснак В.Ф.
assistant / асистент
ORCID:0000-0002-3847-7416
Gerasym L.M./ Герасім Л.М.
c.med.s., as./ к.мед.н.,ас.
ORCID:0000-0002-5902-6091
Marchuk O.F./ Марчук О.Ф.
c.med.s.,as./к.мед.н.,ас.
ORCID:0000-0001-7690-934X
Dronyk I.I./Дроник І.І.
c.med.s.,as./к.мед.н.,ас.
ORCID:0000-0003-2215-6076
Bukovinian State Medical University, Chernivtsi, Teatralna Sq., 9, 58001
Буковинський державний медичний університет, Чернівці, Театральна пл.,9,58001

Abstract: *This article covers the problems of etiology and pathogenesis of diseases of the musculoskeletal system and connective tissue in general. The shoulder joint is one of the most mobile joints of the body and is characterized by a significant amplitude of movements in all planes. Recently, the syndrome of hyper mobility of joints, the morphological manifestation of which is undifferentiated connective tissue dysplasia, is becoming more common. The causes and mechanisms of connective tissue inferiority are still not fully understood. It is now believed that the instability of the shoulder joint is the result of a combination of several causal factors, the main of which are disorders of nerve regulation of muscle response during movement, Hill-Sachs defects, disorders of the elements of the shoulder joint, which generally leads to instability of the shoulder joint.*

Key words: *ligament, capsule, shoulder joint, ontogenesis, human.*

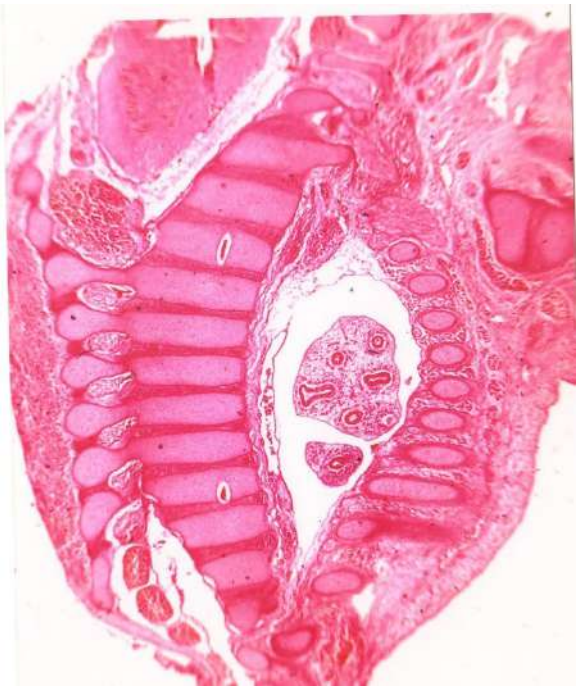
Introduction. The development of the sports industry, the popularization of complex sports cause an increase in the number of traumatic injuries of the shoulder joint. At the same time, scientific and technological progress contributes to a significant reduction in invasive diagnostic methods. This encourages the use of modern methods of radiological diagnostics. Due to the violation of the development of the mesenchyme at 4-8 weeks of the prenatal period of ontogenesis there are such defects in the development of the upper extremities as underdevelopment, fusion of their proximal or distal ends, lack or underdevelopment of anatomical structures.

According to the change of ideas about the causes and conditions of the formation of the mechanism of instability of the shoulder joint, changes in approaches to the treatment of patients with this pathology.

The main text. The shoulder joint consists of four ligaments: the coracohumeral and the upper, middle and lower glenohumeral ligaments. All of them are thickenings of the fibrous layer of the capsule of the shoulder joint. The coracohumeral ligament is located in the thickness of the capsule along the tendon of the long head of the

biceps. The beginning of the coracohumeral ligament is the outer base of the coracoid process of the scapula, and the place of attachment is a large humerus. In adults, the length of the ligament can reach 30.0-40.0 mm, width - 10.0-15.0 mm, thickness - 3.0-4.0 mm. The ligament is a slight thickening of the fibrous layer of the capsule.

The glenohumeral ligaments are located in the thickness of the anterior wall of the capsule and originate from the anterior semicircle of the lip of the glenoid cavity. The place of their attachment is the anatomical neck of the humerus. The upper glenohumeral ligament is 20.0-25.0 mm long and 2.0 mm wide and thick. The middle glenohumeral ligament reaches 21.0-36.0 mm in length, 3.0-11.0 mm in width, and 2.0-4.0 mm in thickness. The lower glenohumeral ligament is 36.0-41.0 mm long, 16.0-27.0 mm wide and 4.0-6.0 mm thick. Of all the shoulder ligaments, the middle glenohumeral ligament is the most variable, it can have four variants of development.



The development of the ligaments of the shoulder joint depends on the topographic and anatomical features of the location of the adjacent muscles.

The coracohumeral ligament develops from the embryonic remnant of the biceps tendon, which in the early stages of development is located in the thickness of the capsule elements. The glenohumeral ligaments develop in close dependence on the location of the subscapularis tendon. They are well developed when the tendon of the subscapularis muscle of the upper part passes into the capsule cavity of the shoulder joint and, conversely, the ligaments are absent in the extracapsular location of the tendon.

The connecting apparatus of the shoulder joint - the capsule of the shoulder joint is a thin-walled bag, reinforced in the tissue department by a bundle of fibrous fibers, which is fixed directly on the edges of the articular surfaces. The capsule of the shoulder joint is a fibrous formation that separates from the surrounding muscles. The capsule tab is formed around the bony edge of the articular cavity of the scapula. The upper part of the inner surface of the anterior wall of the capsule of the shoulder joint

begins slightly inward from the anterior edge of the articular cavity of the scapula. The displacement of the capsule origin is due to the intra-articular location of the tendon of the long head of the biceps and the presence of a subscapular synovial protrusion on the anterior surface of the scapular neck. The fusion between the capsule of the shoulder joint and the outer edge of the lip of the articular cavity does not definitively confirm the probability of the origin of the capsule of the shoulder joint from the articular lip.

The place of attachment of the capsule of the humeral joint to the humerus is its anatomical neck. Depending on where the shoulder joint capsule is attached to the articular cartilage of the humeral head, there are several options for attaching the capsule. With age, there is a distal shift in the level of attachment of the humeral capsule to the humerus, which is due to age-related changes in the attachment of the shoulder girdle muscles, the tendons of which are fused to the humeral capsule. The thickness of the articular cartilage depends on the load distribution, the test joint during movement, and the shape of the articular surfaces. The cartilage is most delicate in those areas where the joint is under great pressure. Therefore, the generally accepted position of greater thickness of articular cartilage in the center of convex articular surfaces and less - on the periphery is correct only for the most spherical shoulder joints. The fibrous layer of the capsule of the shoulder joint consists of fibers arranged in several layers, most developed at the site of attachment of the capsule to the bones and completely absent in the synovial vagina. The direction of the fibrous fibers of the capsule is also identical with the direction of the tendon fibers of the surrounding muscles.

At the beginning of the fetal period, the fibrous layer of the capsule is weak. The intensity of the development of the fibrous fibers of the capsule is observed at the junctions with the muscle tendons.

The thickness of the capsule can vary from 1.0 mm - in the upper part of the anterior wall of the capsule, the thinnest place - the place of formation of synovial vagina, up to 6.0 mm - the lower part of the anterior wall of the capsule, the thickest place - the place of attachment to the humerus and bones shoulder girdle.

Conclusions:

1. The development of the ligaments apparatus of the shoulder joint depends on the topographic and anatomical features of the location of the adjacent muscles and is a thickening of the fibrous layer of the capsule of the shoulder joint.

2. Capsule of the shoulder joint - fibrous formation. The place of its beginning and attachment is caused by the syntopic influence of the tendon of the long head of the biceps and the muscles of the shoulder girdle.

3. The thickness of the capsule of the shoulder joint in the early period of ontogenesis increases in the caudal direction.

References

1.Поздніков Р.В. Анкерна стабілізація капсули в разі передньої травматичної нестабільності плечового суглоба / Р.В. Поздніков // [автореферат]. – Харків - 2017. - 20 с.

2.Михальченко О.М. Нормальна анатомія плечового суглоба через призму

магнітно-резонансної терапії / О.М. Михальченко, В.Т. Євсєєнко, І.М. Зазірний // Ортопедия, травматология и протезирование. – 2014. - №3. – с.113-121.

3.Волошин М.А. Особливості товщини капсули кульшового суглоба в нормі та після внутрішньоплідного введення антигенів / М.А. Волошин, А.В. Федотченко, О.О. Молчанов // Актуальні питання фармацевтичної і медичної науки та практики. - 2011. - Випуск XXIV. – Т1. – (55). – с.5-7.

4.Литвин Ю.П. Статична та функціональна ультрасонографічна картина плечового і ключично - акроміального суглобів в нормі та при гіпермобільності / Ю.П. Литвин, М.І. Спузяк, В.В. Логвиненко, О.Б. Механевич // Морфологія. - 2012. - Т.VI. –с.64-70.

5.Волошин М.А. Морфофункціональний стан субсиновіальної основи капсули суглоба протягом постнатального періоду в нормі та при формуванні недиференційованої дисплазії сполучної тканини / М.А. Волошин, А.В. Федотченко, М.С. Щербаков, С.В. Чугін // Таврический медико-биологический вестник. - 2012. - Т.15 (58). - с.60-64.

6.Григор'єва О.А. Морфологічна характеристика формування капсули суглоба щурів у післянатальному періоді у нормі та експерименті / О.А. Григор'єва, Е.Р. Скаковський // Вісник проблем біології і медицини. – 2017. - №2 (136). – с.279-286.

7.Akimoto Nimura. The superior capsule of the shoulder joint complements the insertion of the rotator cuff / Akimoto Nimura, Kumiko Yamaguchi, Atsuo Kato, Tomoguki Mochiruki // Journal of shoulder and elbow surgery. American Shoulder and Elbow Surgeons. – 2011. - №21(7). – с.867-872.

8. Clark J.I. The relationship of the glenohumeral joint capsule to the rotator cuff / J.I. Clark, J.A. Sidles, F.A. Matsen // Clin Orthop Relat Res. – 1990. - №254. – с.29-34.

9. Хмара Т. В. Онтологія уроджених вад плечової кістки та кісток передпліччя / Т.В. Хмара, Д.М. Нікорич, М.Б. Стабрин, М.О. Ризничук, Г.Я. Стельмах, М.Ю. Лека // Український журнал медицини, біології та спорту. – 2020. – Том 5. - № 4 (26). – с.61-70.

10.Гуніч В. Функціональний аналіз плечового суглоба ссавців / В. Гуніч, Ж. Коренєва, А. Голованова, Н. Хомкович, О.Чернишева // Agrarian Bulletin of tte Black Sea Littoral. – 2020. - Issue 97. – с.39-48.

Анотація: *Дана стаття висвітлює проблеми етіології та патогенезу захворювань кістково-м'язової системи, і сполучної тканини взагалі. Плечовий суглоб є одним із найбільш мобільних суглобів тіла та характеризується значною амплітудою рухів в усіх площинах. Останнім часом набуває все більшої поширеності синдром гіпермобільності суглобів, морфологічним проявом якого є недиференційована дисплазія сполучної тканини. Причини та механізми розвитку сполучнотканинної неповноцінності досі залишаються не в повній мірі вивченими. Нині прийнято вважати, що нестабільність плечового суглоба є наслідком сукупного впливу декількох причинних факторів, основними з яких є порушення нервової регуляції відповіді м'язів під час рухів, дефекти Hill-Sachs, порушення співвідношень елементів плечового суглоба, що в цілому призводить до нестабільності плечового суглоба.*

Ключові слова: *зв`язковий апарат, капсула, плечовий суглоб, онтогенез, людина.*

Стаття відправлена 20.01.2022.

Руснак В.Ф.

СОДЕРЖАНИЕ/CONTENTS

Chemistry and pharmaceuticals

Medicine and health care