

CASE REPORT: SHOULDER IMPACT SYNDROME WITH TREATMENT COMPLICATIONS DUE TO UNCONTROLLED TYPE II DIABETES MELLITUS

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Abstract: Justification: Shoulder impingement syndrome (SIO) is a degenerative inflammatory disease, which occurs due to mechanical damage caused to structures located in the subacromial space of the shoulder joint and whose conservative treatment is mainly performed through physical therapy, with muscle strengthening. However, the presence of uncontrolled type II diabetes mellitus (DM II) makes this treatment ineffective due to the muscle degeneration it causes. **Goals:** From the report of a patient with OIS, to highlight the difficulty of conservative treatment when DM II is decompensated. **Case report:** O.L.G., 46 years old, male. Diabetic for 16 years, without adherence to treatment, he started to have pain in both shoulders, sought a doctor and was diagnosed with OIS and started conservative treatment, but he did not improve. **Conclusion:** The approach of a patient with decompensated OIS and DM II is relevant, as it makes the treatment ineffective, leading to aggravation of the condition and reduction of the individual's quality of life.

Keywords: impingement syndrome, type II diabetes mellitus, Shoulders.

INTRODUCTION

SHOULDER ANATOMY

Shoulder joint (glenohumeral)

The shoulder joint is a ball-and-socket-type synovial joint that allows a wide range of motion.

The humeral head, large and round, articulates with the glenoid cavity of the scapula, which is relatively shallow, but the glenoid labrum, a fibrocartilaginous, annular structure, slightly deepens this cavity. Both joint surfaces are covered by hyaline cartilage.^{1,2,3}

The loose fibrous membrane of the joint capsule surrounds the shoulder joint and

attaches medially to the margin of the glenoid cavity and laterally to the anatomical neck of the humerus. Superiorly, this part of the joint capsule invades the root of the coracoid process, such that the fibrous membrane surrounds the proximal attachment of the long head of the m. biceps brachii to the supraglenoid tubercle of the scapula within the joint. The joint capsule has two openings, one between the tubercles of the humerus for the passage of the tendon of the long head of the m. biceps brachii and an opening located anteriorly, inferior to the coracoid process, which allows communication between the subscapular bursa and the synovial cavity of the joint. The synovial membrane lines the inner surface of the fibrous membrane of the joint capsule and is reflected over the glenoid labrum and humerus to the articular margin of the head.^{1,2}

Shoulder joint movements

The shoulder joint allows movement around three axes, enabling flexion-extension, abduction-adduction, rotation (medial and lateral) of the humerus, and circumduction.^{1,2}

Rotator cuff muscles.

These are the supraspinatus, infraspinatus, teres minor and subscapularis. All, with the exception of the supraspinatus muscle, are rotators of the humerus. The tendons of the rotator cuff muscles fuse and reinforce the fibrous lamina of the joint capsule of the shoulder joint. Tonic contraction of the collaborating muscles maintains the head of the humerus in the glenoid cavity of the scapula during arm movements.^{1,2,3}

Supraspinatus: occupies the supraspinatus fossa of the scapula. A pouch separates this muscle from the lateral quarter of the fossa.^{1,2}

Infraspinatus: occupies the medial three quarters of the infraspinous fossa and is partially covered by the deltoid and trapezius muscles. Helps stabilize the shoulder joint and is a powerful lateral rotator of the humerus.^{1,2}

Round minor: narrow and elongated, completely hidden by the m. deltoid. It works with the m. infraspinatus to perform lateral rotation of the arm and help in its adduction. It is more clearly distinguished from m. infraspinatus to be supplied by n. axillary while the infraspinatus is supplied by the n. suprascapular.^{1,2}

Subscapularis: It is thick and triangular, is situated on the costal surface of the scapula and forms part of the posterior wall of the armpit. It crosses the anterior surface of the scapulohumeral joint on its way to the humerus. It is the main medial rotator of the arm and also adducts it.^{1,2}

DIABETES MELLITUS TYPE II

Type II diabetes *mellitus* is a syndrome that compromises the metabolism of carbohydrates and, consequently, of fats and proteins. It is caused by the absence of secretion or by reduced tissue sensitivity to insulin. A characteristic aspect of this disease is the deficient secretory response of insulin, which is manifested in the inadequate use of carbohydrates (glucose), causing hyperglycemia.⁴

SHOULDER IMPACT SYNDROME

The Shoulder Impingement Syndrome (SIO) is an inflammatory and degenerative pathology characterized by the mechanical impact or compression of certain structures located in the humerocoracoacromial space, especially the supraspinatus muscle tendon. This syndrome progresses with the cumulative effect of impact, and being subject to such repetitive impacts between the humeral head and the acromion. The acromion is a bony projection from the outer end of the spine of the scapula.⁵

The repetitive compression that OIS causes can generate from edema to the total or partial rupture of one or more tendons of the rotator

cuff, going through an intermediate phase of inflammation and, as a consequence, there is pain.⁵ There are three stages described for this syndrome (Balke):

Stage 1: Involves swelling and hemorrhage in the tendon of the supraspinatus muscle

Stage 2: Involves fibrosis and tendonitis

Stage 3: Involves partial or complete tearing of the rotator cuff.

The space between the bottom of the acromion and the top of the humeral head is called the “impact gap”, also known as the subacromial space. This space is very small and narrows even more when the arm is abducted. Consequently, any condition that induces the reduction of this space, such as the type of curvature of the acromion, can cause injury. Therefore, excessive use of the upper limb in elevation, during certain sports or professional activities, favors the emergence of Impact Syndrome. Regarding the curvature of the acromion, there are three morphological variants:

type I: flat acromion – found in 17% to 32% of the population; type II: curved acromion – found in 40 to 45% of the population; type III: hooked acromion – found in 26 to 40% of the population.

Among these three types, the highest incidence occurs in types II and III. Such variations may change according to the age of the individual, the most common being the accentuation of curvature with aging.⁶

There are two means of treatment: conservative and surgical approach. The first is based on analgesic and anti-inflammatory measures associated with a continuous and individualized rehabilitation program. The second is recommended in cases where the clinical picture remains unchanged, even after conservative treatment lasting three to six months.⁵ After pain relief and reduction of the acute inflammatory process, exercises to gain range of motion and improve flexibility

of the lateral, medial and rhomboid rotator muscles of the shoulder should be included in the rehabilitation program.⁵

CASE REPORT

O.L.G., 46 years old, male, white, married, insurance broker, from São Carlos, diagnosed with type II diabetes mellitus for 16 years, non-adherent to treatment, developed of sensitivity in lower limbs and fall of phaneros in the same region. She reported asthenia and vertigo during this period.

For 13 months, she reported pain in both shoulders, accentuated on the left side, sudden onset, burning, intermittent, radiating to the cervical region, of intensity (10/10), triggered by moving the arms above the head. It worsened with the practice of physical activities, with the absence of improvement factors. After a month, he sought an orthopedist, when the physical examination was performed (Tables 1 and 2).

TESTS	RESULTS
Neer	Positive
Jobe	Negative
Speed	Negative
Yergason	Positive

Table 1: Physical examination tests and results.

ANALYSIS	RESULTS (mg/dL)	REFERENCE VALUES
Glucose	335	70 to 99 mg/dL
LDL-Cholesterol	148	< 130 mg/dL
Total Cholesterol	218	< 200mg/dL

Table 2: Laboratory analysis.

The magnetic nuclear resonance diabetic neuropathy for 3 years, with loss showed supra

and infraspinatus tendinopathy, in addition to bursitis. Based on the results, the patient was diagnosed with Impingement Syndrome in the shoulders.

Conservative treatment was chosen, using drug and physical therapy. He was medicated with Nimesulide 50 mg, every 12 hours, to treat inflammation of the synovial sac, and Tramadol 50 mg, every 6 hours, for analgesia. It was not successful.

Physiotherapy consisted of twenty strengthening sessions for one month, with no improvement. Then, 10 physiotherapy sessions were performed for analgesia, with no progress in the clinical picture.

Conservative treatment was not satisfactory for the patient. Currently, he is in pain with the same characteristics mentioned above. The individual still refuses to follow a hypoglycemic diet and to use medication to control blood glucose. Surgical treatment is a future option for the case, but it is necessary that the tendon is first torn by wear.

DISCUSSION

Shoulder impingement syndrome is the most common condition of the shoulder girdle. It can affect both sides, with a higher prevalence in individuals aged 40-50 years.⁵

The pathology is related to some work activities, becoming common in workers who perform functions with an elevated upper limb for long periods, as well as the type of sports activity practiced, such as volleyball, tennis and swimming.⁵

The rotator cuff is of fundamental importance in the biodynamics of the shoulder and is a frequent cause of pain. The shape and thickness of the acromion and the acromioclavicular joint should be studied radiologically and classified using the Bigliani & Morisson criteria.⁵

The diagnosis of OIS is based on the patient's medical history and requires the

physician to be able to collect this history as completely as possible. A detailed physical examination is also required to assess the degree of rotator cuff limitation. Complementary exams (magnetic resonance imaging, radiography, ultrasound) help to visualize the integrity and compromise of local structures, being necessary to close the diagnosis.⁷

During the physical examination, with Neer's test, the greater tubercle of the humerus projects against the anterointerior surface of the acromion and reproduces the impact, with the characteristic pain caused by irritation of the serous bursa and the supraspinatus tendon.⁸ The positive sign for the Yergason test occurs when pain or tenderness to palpation in the tendon of the biceps brachii when supinating the forearm against resistance and lateral rotation of the shoulder, tensioning the biceps brachii tendon and the transverse humerus ligament.⁹

The importance of conservative treatment is to restore the patient's condition gradually and in a less traumatic way than surgical intervention, in cases where it is not necessary. Physiotherapy, associated with analgesic and anti-inflammatory measures, is an important ally in the conservative treatment of OIS, as it can provide relief from symptomatological conditions and the restoration of normal function of the affected shoulder. This highlights the importance of the involvement of different health professionals to recover the individual with multidisciplinary conservative treatment.^{10,11}

A specific and individual program must be designed for the patient, according to the clinical conditions in which he is. Some factors such as age, types of activities and variations anatomical features of the acromion may interfere with treatment time and results. An adequate and early intervention, associated

with re-education and guidance of the individual, which emphasize changes in sports habits or professional readaptation are essential for successful treatment. In the case discussed, decompensated type II diabetes mellitus means that conservative treatment does not achieve the expected improvement for the condition.^{12,13}

In a study carried out by Chinese researchers, the effect of diabetes on skeletal muscle was confirmed in diabetic rats and the results indicate that the loss of muscle mass is related to the level of oxidative stress.¹⁴ Thus, decompensated DMII compromises muscle mass gain and does not allow for strengthening of the shoulder musculature and impairs the physical therapy treatment.⁵

There was no improvement factor for the pain, so corticoid infiltration was proposed, but the patient could not be submitted to this method, because his condition restricted the use of the drug, because it affects the metabolism of carbohydrates. Corticosteroids produce a tendency to hyperglycemia mainly due to increased hepatic gluconeogenesis and peripheral antagonism to insulin action resulting in decreased glucose uptake in muscle and fat tissue.¹⁵

Still in this case, surgery is not recommended, as the tendon has not yet been torn. Even after the rupture, the procedure would only serve to restore it again, without solving the patient's anatomical problem, caused by the altered angulation of the acromion.

In this report, it becomes evident the need to control type II diabetes mellitus for the success of conservative therapy in the treatment of shoulder impingement syndrome, since, being decompensated, it proves alterations that directly involve the biodynamics of recovery and, consequently, the patient's quality of life.

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