

# Rotator cuff Disease: Aspects and Implications

## Afección del Manguito Rotador: Aspectos e Implicancias

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**SUMMARY:** The objective this study was analyze the characteristics of the rotator cuff disease carrying and its implications by the lesion evolutionary stage. 112 patients with initial diagnosis of rotator cuff disease were interviewed, most of them women, average age of 51 years, right side more injured, with evidence to be the most damaged ( $p=0,00$ ) and with a lot incapacity to move the upper limbs ( $p<0,05$ ). The most found pathology stage was the partial rupture of supraspinatus tendon, 26,16 months of attendance and without association with pathology stages. Most of patients were treated with physiotherapy and just 19% of them were submitted to the surgery procedure. It has shown that this pathology implies in lots functional damages, affects social and work standard with high incapacities on upper limbs even after treatment.

**KEY WORDS:** Shoulder impingement syndrome; Physical therapy; Rotator cuff.

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## INTRODUCTION

In the latest years, a lot has been researched about the anatomical-pathological mechanism of the rotator cuff disease (Greve *et al.*, 1992; Bertocello *et al.*, 1999), because it constitutes the most common cause of painful symptoms or functional limitation of the shoulder (Giordano *et al.*, 2000; Guimarães, 1995; Carpenter *et al.*, 1998).

The rotator cuff complex formed by the tendon of supraspinatus, infraspinatus, subscapularis and teres minor muscles (Gagliardi & Lissi, 2002; Hamil *et al.*, 1999) is essential during the arms common movements, demands from these structures a perfect integrity and anatomic configuration for the correct functionality (Plancher *et al.*, 1995; Teixeira-Salmela & Monteiro, 2001).

Factors as inadequate posture of upper limbs (Sakata & Issey, 2003), repetitive (Carpenter *et al.*; Filho & Barreto, 1998), biologic aging, lack of vascularity related to the tendon and traumatism are quoted as the main causes of rotator cuff disease (Lin *et al.*, 2001; Novak & Mackinnon, 1997; Ludewig & Borstard, 2003; Pope *et al.*, 2001). The structures more attacked are supraspinatus tendon, long head of brachial biceps muscle and sac synovial subacromial (Greve *et al.*, 1992).

The theory of impact described by Neer (1983), defined as the supraspinatus tendon compression against the coracoacromial arc when upper limb is raised, has a strait relation with the pain in the shoulder (Neer; Whiting & Zernicke, 2001). The presence of an hypovascular area benefits the evolution of a lesion in this part (Rockwood & Matsen III, 2002) joining with alterations in elasticity, flexibility and mechanical capacity (Greve *et al.*, 1992).

Abduction and repeated lateral rotation of the arms above transcromial line cause inflammatory procedures and, sometimes, caused by rotator cuff rupture of acromial impact against supraspinatus tendon, which preclude movements with the arm and prejudice its activities (Sporrong *et al.*, 1999; Stenlund *et al.*, 2002).

Pathology spectrum of rotator cuff disease is wide and goes from a stage of tendonitis until a total rotator cuff tears (Ragasson & Stabille, 2001). It is justified by the interest in understand the lesions on the shoulder biomechanic and the pathology process to help the characterization of clinical stage in a more effective way (Fuentes, 2003).

It has looked for in this study exclude from the ranks the patient with rotator cuff disease since the lesion evolutionary stage as well as to demonstrate its implications on these patients' lives.

## METHOD AND METHOD

It is a transversal study, 112 patients were interviewed with initial diagnosis of rotator cuff disease made between April and November of 2004, in the Ambulatory Service of Superior Member of Orthopedics and Traumatology Department in a public hospital of São José do Rio Preto Medicine School, approved by the Ethics Committee in Research from the same institution, register N° 1941/2004.

All the patients did the ultrasound and/or magnetic resonance to confirm the diagnosis. They were factors of exclusion, people with history of surgeries or preceding fractures on the shoulder, articular instabilities and affection in a tendon that weren't of the supraspinatus muscle.

He/she acts, pathology evolution, team of medical attendance, proposed treatment and present incapacities were analyzed.

The informations were kept on Microsoft Excel and submitted to statistical descriptive analysis. The results analyses were made by test qui-square, Mood and "t" of Student. The significance level was 5%.

## RESULTS

The descriptive analysis has shown that between the 112 patients, 75 (67%) were from the female sex and 37 (33%) were from the male sex, whose average age was of 51 years with a pattern deviation of 9 years and median value of 52 years. The most found pathology stage (45%) was the partial rupture of the supraspinatus tendon (50), tendonitis in 46 patients (41%) and total rupture of the same tendon in 16 patients (14%). The right side was more attacked, represented by 78 (69%) of the patients, followed by the left side with 30 (27%) and with 4 (4%) injured both limbs.

Between the analyzed patients, female sex had more frequency in diagnosis partial rotator cuff tears of supraspinatus represented by 37 (74%) women and the male sex with 13 (26%). Similar results were verified in relation to the supraspinatus tendonitis with 65% (30) in women

and 35% (16) in male. The total rotator cuff tears of supraspinatus tendon had the same percentage in both sexes, with 50% represented by 8 patients. By the statistics analysis, there was not association evidence between sex and diagnosis ( $p=0,20$ ).

Considering the time of medical attendance since the date of the first consultation in the orthopedics ambulatory until the interview date of this study, the average found was 26,16 months with pattern deviation of 20 months.

The averages of medical attendance time according to the pathology stage were of 27 months for partial rupture of supraspinatus tendon with pattern deviation of 21 months, 26 months for total tears with pattern deviation of 16 months and 25 for supraspinatus tendonitis with pattern deviation of 20 months. The median values found were: 23 months to patients with partial tears of supraspinatus tendon, 26 months to those with total tears of the same and 20 months to those with supraspinatus tendonitis. According to the Mood test to median values, there was not evidence of difference between the median values of the medical attendance period by diagnosis ( $p=0,70$ ).

There was not significance of difference between the period medias of the medical attendance according to the sex.

It has observed that most, in other words, 103 (92%) of the patients were orientated by the orthopedist doctor to the physiotherapeutic valuation. From these, 93 (83%) have already done physiotherapy treatment in a period of time of 2 to 4 years, followed by 26 (28%) in more than 49 months. Although, there was not association evidence between time of physiotherapy treatment with evolution of the pathology spectrum ( $p=0,90$ ).

According to the patients report, the physiotherapy procedures more used were the exercise with 81% (78) and the electrotherapy with 68% (63). Other resources were also quoted as cryotherapy (15%) and use of massage (5%).

It was verified that 21 (19%) were submitted to surgery treatment and almost its totality (95%), representing by 20 patients, appealed to physiotherapeutic treatment after the surgery procedure.

From all samples, 88 (79%) patients had difficulty to perform external rotation with limb elevation (movement to comb the hair); 93 (83%) had difficulty to perform interior rotation (movement to touch the back pocket); 106 (95%) of them presented difficulty to raise the upper limb by the front of the body, making the major tuberosity get

in touch with the coracoacromial arc (scratch the back). Between the 75 women studied, 70 (93%) had difficulty to perform the movement of interior rotation with shoulder abduction (to put the bra). According exact test to a proportion, there was evidence that most had difficulty to perform all the quoted movements (value- $p < 0,05$ ).

## DISCUSSION

Rotator cuff disease is one of the occupational health problems more frequent on the orthopedics ambulatory (Carpenter *et al.*; Leclear *et al.*, 2004) with high functional damages to its carrying.

Between the patients interviewed, most was female sex, justified to be related more to the kind of activity than to the sex, since women perform different tasks from the ones performed by the men, plus the domestic activities that make difficult the body recovery (Sakata & Issey; Walsh *et al.*, 2004).

In relation to the patients age, the literature is corroborated with the discoveries found in this study, showing that the patients incidence with rotator cuff disease increase with the age, mainly in people over 50 years (Rockwood & Matsen, 2002; Gagliardi & Lissi, 2002). The aging can be an isolated factor to the pathology appearance (Santos & Filho, 1998). Nevertheless, the disease can be said as a normal degenerative attrition, not necessarily pain causative and shoulder incapacity (Tempelhof *et al.*, 1999).

The rotator lesions are initiated with more frequency in profundity and extend to the surface until become thickness totality defect (Rockwood & Matsen), results also found in this study.

It has occurred the lesion occurrence in the right side with more frequency is, that is, referred in another's scientific studies. This study suggests relation between dominant limb and lesion side. However, there is a study appointing that there was not predominance of alteration to the radiography in dominant upper limb (Santos & Filho, 1998).

The interpretation of the medical attendance period is also corroborated by the authors (Greve *et al.*, 1991; Rockwood & Matsen), showing to be around 25 months. The conservative treatment has shown off important to the pathology rehabilitational process. Nevertheless, it is necessary to identify specific methods, having in mind the divergences that takes to failure or treatment delay.

Discussing techniques of physiotherapeutic treatment, Souza (1994) believes that modalities as cryotherapy, electrotherapy and exercise can have great values on shoulder lesions treatment, in other words, the physiotherapeutic treatment relieve the pain, decrease the functional deficiency, rehabilitating the patient (Cailliet, 2000), as it was showed in another studies (Lech *et al.*, 2000; Giordano *et al.*).

Guimarães points out that the conservative treatment has changed between less than 33% and more than 90% of good and excellent results. However, there is variation of these results, due to the sample age and the results interpretation.

Incapacity of trivial movements of the upper limbs were discussed by the authors (Geert, 2000; Crusher, 2000), emphasizing great social and work impact in these patients lives, seeing that the most present functional damage on the arms movement (Filho & Barreto; Rockwood & Matsen), due to pain and the muscular weakness.

Biomechanically, the front deltoid is very active on frontal flexion and medium deltoid in the abduction; according to the deltoid strength is directed to upward in the presence of a weak rotator mechanism, the contraction cause an upper dislocation of the humeral head, so that it compresses the rotator cuff remainder in oppose to the coracoacromial arc, increasing the impact process (Rockwood & Matsen). The activity above the head for an extended period and the associated strength created by the deltoid in the direction of the acromion is, therefore, a contributing factor (Rockwood & Matsen), justifying the reason of the difficulty on the interior rotation of the movements, elevation of the upper limbs, interior rotation with shoulder abduction (Ludewig & Borstad), also results found in this study.

The factors involved are evident in the genesis of the rotator cuff disease and its implications. For the patient, in general, the capacity to raise the upper limb actively means functional recovery satisfactory, independent of the grade of amplitude reached. In this way, to return the functionality of the patient's arm is the main goal on the mechanism of the treatment.

In the analysis of this casuistry, it could be found out that the attendance time is large, besides the presence of high incapacities in the trivial movements realization like to get dressed up, which shows that this pathology is a deficiency that implies incapacity and disadvantage social, even after the treatment.

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**RESUMEN:** El objetivo del estudio fue analizar las características de los portadores de la afecção del manguito rotador y sus implicancias por el cuadro de la lesión. Fueron entrevistadas 112 personas, con diagnóstico inicial de afecção del manguito rotador, la mayoría compuesta por mujeres de alrededor de 51 años, siendo el lado derecho más afectado, con evidencia de ser el más perjudicado ( $p=0,00$ ) y con gran incapacidad de mover los miembros superiores ( $p<0,05$ ). La patología más frecuente fue la ruptura parcial del tendón del músculo supraespal, con tratamiento de 26,16 meses y sin asociación con los estados de la patología. La mayoría de los casos fueron tratados con fisioterapia, y sólo el 19% fue sometido a procedimiento quirúrgico. Se verificó que esta patología provoca grandes perjuicios funcionales, afectando tanto el ámbito social como laboral, produciendo altas incapacidades en los miembros superiores, aún después del tratamiento.

**PALABRAS CLAVE:** Síndrome de pinzamiento del hombro ; Terapia física; Manguito de los músculos rotadores.

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