PERITROCHANTERIC BURSITS: A DESCRIPTION OF A NEW SEMIOLOGIC MANEUVER FOR DIAGNOSTIC ASSISTANCE

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SUMMARY

The objective of the present study was to test the validity of a semiologic maneuver on the diagnosis of peritrochanteric bursitis. Thirty patients with a clinical diagnosis of great trochanter bursitis were assessed. All patients were submitted to X-ray studies at AP and LP. Whenever necessary, other imaging tests were performed, intending to rule out any associated diseases; the patients were submitted to two semiologic maneuvers on both hips, the affected and the normal one. TEST 1: with patient at supine position, the examined limb is adduced in extension and crossing it over the contralateral limb, with the calcaneus touching the bed, a hip flexion is produced at approximately 90°; at the end of this maneuver, the hip will be flexed, adduced and slightly externally rotated; during this maneuver, the patient may report pain at major trochanter region. TEST 2: the final position of TEST 1 is the initial position of TEST 2, with a forced hip adduction where pain or exacerbation may be reported. The maneuver results were submitted to statistical analysis, with both tests showing to be different from each other while supplementary. Test 2 was shown to be positive in 96.6%. CONCLUSION: Semiologic maneuvers referred as TEST 1 and TEST2 may be used to assist on providing a clinical diagnosis of peritrochanteric bursitis.

Keywords: *Bursits/diagnosis; Femoral fractures; Humans.*

Citation: *Fujiki EN, Valesin Filho ES, Soutello HPF, Furlan C, Yamagushi EN. Peritrochanteric bursitis: a description of a new semiologic maneuver for diagnostic assistance. Acta Ortop Bras. [on-line]. 2008; 16(5): 296-300. Available at URL: http://www.scielo.br/aob.*

INTRODUCTION

Hip pain is a common complaint in orthopaedic outpatient facilities. However, with a good anamnesis, gait observation and a careful semiology of the hip we can distinguish chronic and actute conditions; if the affection is intra-or extra-joint, and, and a fracture from an inflammatory process [(1)]. In addition, one should rule out diseases involving spine and nervous roots, as well as genitourinary, abdominal, blood flow-related, women's health conditions and soft parts changes involving that region.

Intra-joint changes such as arthrosis, sequels of childhood diseases, avascular necrosis, joint impact with labral changes, infections, cause, additionally to pain complaints, a reduced joint motion at examination. On the other hand, peri-joint changes, such as tendonitis and bursitis usually don't cause joint motion reduction, but pain, with the most common one being the major trochanter bursitis[(2)], and, more rarely, ilio-psoas and tuberosity bursitis. Usually, these diseases are related to microtrauma or chronic post-trauma, or, also, in athletes due to overload; however, most of times, they are clinically treated, with rare surgical indication.

Semiology for diagnosing trochanteric bursitis in literature is not much clear, but the following are mentioned: painful palpation of the major trochanter[(3)], pain worsened with flexion and internal or external rotation, potentially associated to abduction [(4)] or adduction[(3)]; i.e., no specific maneuver is described for such condition. However, most of the authors report that for such diagnosis a simple clinical examination and a PA and lateral hip X-ray image are enough for ruling out other diseases, i.e., diagnosis is clinically made by pain reports on the region of the major trochanter at palpation, pain irradiated to thigh, and, basically, by ruling out the existence of other diseases.

OBJECTIVES

This study is aimed to describe a semiologic maneuver that could help to provide a clinical diagnosis of this disease.

MATERIALS AND METHODS

Study approved by FMABC's Committee on Ethics in Research, protocol nr. 154/2006.

Thirty patients were assessed, totaling 34 hips, followed up with clinical and X-ray diagnosis of major trochanteric bursitis receiving healthcare at the Orthopaedics outpatient facility at Hospital Mário Covas (12 cases) and at a private practice (18 cases), examined and followed up by only one physician duly trained on hip conditions. Hip X-ray images were captured at AP and lateral planes bilaterally.

Exclusion criteria: patients younger than 18 years, history of acute trauma, lower limbs' asymmetry above 2.0 cm, previous hip surgeries, history of fever in current disease, reduced joint motion, joint X-ray changes at frontal and/or lateral hip planes (arthrosis, sequels of childhood diseases, necrosis, fractures, impact, etc.). More accurate imaging tests can be used such as: ultrasound, tomography or magnetic resonance at clinical discretion for diagnosing other joint or peri-joint diseases. In the presence of other associated diseases, patients were excluded from the study.

Patients regarded as able to be included in the study and diagnosed with major trochanteric bursitis were submitted to two semiologic maneuvers called Test 1 and Test 2, both on the affected and normal hip, when disease is unilateral. Patients were assessed using the same tests on the second and fourth week of treatment.

Study conducted at ABC Medical School.
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Received in 06/20/007 approved in 09/06/07

TEST 1
1 – Patient positioned at supine position on the bed, with extended lower limbs and at neutral functional position, with the investigator positioned on the same side of the involved hip; the investigator take the involved lower limb (for example, the right one) with his right hand supporting it on the distal third of the leg, adducing it, crossing it over the contralateral limb, slightly flexing the knee with the affected calcaneus touching the bed. Hip and knee are flexed, supporting it at knee level and sliding the calcaneus close to the bed, forcing it to a position of 80° - 90° of hip and knee flexion, position in which the hip assumes a flexed and slightly externally rotated position. During this maneuver, the patient may report pain at the region of the major trochanter or not. (Figures 1 and 2)

TEST 2
2 – Starting with the patient at the final position of Test 1, forcing adduction on the affected hip with the investigator's right hand supported at knee level and, with the left hand, pelvis is firmly positioned on the iliac wing, ipsilaterally to the patient. At this moment, the patient may report pain or pain exacerbation at the major trochanter level during the maneuver. The same maneuver is performed for left hip, but with hands inverted. (Figures 3 and 4)
Patients were treated for major trochanter bursitis, with clinical and physiotherapeutic methods widely employed in medical practice [5]: relative rest, home-made cryotherapy, non-steroidal anti-inflammatory agents for 10 days, local physical therapy for ten days, and, depending on the need, any therapy may be extended. They can be submitted to local infusion of 2 ml xylocaine, 2% associated to 1 ml corticosteroids (dexamethasone, 5 mg;ml) at clinical discretion (Image 2), followed by physical therapy one week later. All patients were reassessed on the second week post-treatment for pain improvement, and submitted to the semiologic maneuvers (1) and (2). Four weeks later, they will be reassessed again concerning pain improvement and submitted to semiologic maneuvers.

RESULTS

The mean age of the subjects included in the study was 53.13 years, ranging from 32 to 80 years; the mean age for men was 51 years, while women's mean age was 53.07 (Table 1).
Concerning gender, trochanteric bursitis affected women in 90% of the cases (27 patients), and only 10% (3 patients) were men. The right side was unilaterally affected in 14 patients (46.7%) while left side accounted for 12 cases (40%).
In four patients the picture manifestation was bilateral, corresponding to 13.3% of the total sample.
Pelvic X-ray images were captured at AP and lateral planes in all 30 patients. Of these, nine (30%) showed calcification on the X-ray image which were noticed by the investigator. Concerning the other tests performed, one patient was submitted to bone scintiscan, four (13.3%) patients were submitted to magnetic resonance of the pelvis (MRI); nine were submitted to spine X-ray imaging test (30%), and one patient (3.3%) underwent computed tomography and ultrasound scan of the hip. At total, 12 patients (40%) were submitted to other supplementary diagnostic procedures, in addition to pelvic X-ray study (Table 1).
Test 1 was positive for a total of 18 patients (60%), or 21 hips, accounting for 61.7% (Figure 5 and 6).
Test 2 was positive for 29 out of 30 assessed patients (96.6%), or for 33 of 34 hips, accounting for 97% of this total. In our study, only two patients (6.7%) were submitted to local anesthetic + corticosteroid agent infusion, targeting pain improvement. Of these, at the baseline observation after 14 and 38 days of treatment, one patient showed improvement of pain and the other showed only partial improvement.
The remaining 28 patients (96.3%) were satisfactorily benefited from conventional treatment, previously mentioned. Subsequently to primary care, the patients were reassessed twice again, at the first follow-up visit, which was scheduled to the 14th treatment day with physical therapy and NSAID, 24 patients reported improvement of all complaints (80%), with negative tests 1 and 2; six patients (20%) reported only a partial improvement, with positive test 2. At the second follow-up visit (4 weeks after primary care) only one patient still had mild complaints, with the remaining 29 patients (97.7%) were asymptomatic.
In order to check for changes between test 1 and test 2, the MCNEMAR test was employed. This test studies the test's behavior and if its value change (binominal) is statistically significant.
This analysis in the present study generated a significant value of 0.003, reflecting the different behaviors of the tests.
In order to check for the consistency between both tests, the KAPPA test was employed. In this analysis, we achieved statistical values that evidenced inconsistency between the results obtained on the different tests (1 and 2), considering a 95% confidence interval.
And concerning the change of the second test compared to the first one for the same data studied, the sign applied test with

Figure 1 - *(Test 1) Maneuver start: the affected lower limb is taken with investigator's right hand and supporting it on the distal third of the leg.*

Figure 2 - *(Test 1) the limb is adducted by crossing it on the contralateral limb, slightly flexing the knee and touching the affected calcaneus on the bed. Hip and knee are flexed by supporting with the right hand on the leg's distal third and with the left hand supporting at the knee level and sliding the calcaneus close to the bed, forcing it to 80° - 90° of hip and knee flexion, a position in which the hip assumes a flexed position and of slightly external rotation. During this maneuver, the patient may report pain at the major trochanter region or not. Pain report during the maneuver is regarded as positive.*

Figure 3 - *(Test 2) Starts at the final position of test 1*

Figure 4 - *(Test 2) a forced adduction of the affected hip is provided with the investigator's right hand supported at the knee level and the investigator's left hand secures pelvis firmly at the iliac wing, ipsilaterally to patient's position. At this moment, the patient may report pain or exacerbation of pain at the major trochanter level during the maneuver.*

Table 1- *List of study cases distributed for gender, age, positivity of tests 1 and 2, imaging tests and evaluation on the second and fourth weeks of follow-up*

case	gender	age	side	T 1	T 2	X-ray pelvis	X-ray other	images	14 days		28 days
1	F	53	R	neg	pos	AP - L			neg		neg
2	F	56	R	pos	pos	AP - L	spine		neg		neg
			L	pos	pos	AP - L			neg		neg
3	F	62	R	neg	pos	AP - L			neg		neg
4	F	64	L	pos	pos	AP - L			T2 +		neg
5	F	55	L	neg	pos	AP - L	spine	scintiscan	neg		neg
6	F	54	R	neg	pos	AP - L		neg resonance	T2 +		neg
			L	neg	pos	AP - L		neg resonance	T2 +		neg
7	F	45	R	pos	pos	AP - L			T2 +		neg
8	F	41	R	pos	pos	AP - L	spine	pos resonance	neg		neg
			L	pos	pos	AP - L		pos resonance	neg		neg
9	M	45	R	pos	pos	AP - L		pos resonance	neg		neg
10	F	55	R	pos	pos	AP - L			neg		neg
11	F	80	L	neg	pos	AP - L calcif			neg		neg
12	F	55	L	pos	pos	AP - L calcif			neg		neg
13	F	49	L	neg	pos	AP - L			neg		neg
14	F	53	R	pos	pos	AP - L calcif			neg		neg
15	M	41	R	pos	pos	AP - L calcif	spine	us + tac	T2 +	infusion	T2 +
16	F	46	L	neg	pos	AP - L calcif			neg		neg
17	F	73	R	neg	pos	AP - L calcif			neg		neg
18	F	36	R	pos	pos	AP - L			neg		neg
19	F	53	L	neg	pos	AP - L calcif			neg		neg
20	F	36	R	pos	pos	AP - L calcif			neg		neg
21	F	32	R	pos	pos	AP - L		pos resonance	T2 +	infusion	neg
			L	pos	pos	AP - L			neg		neg
22	M	67	R	pos	pos	AP - L			neg		neg
23	F	59	R	pos	pos	AP - L	spine		neg		neg
24	F	32	L	pos	pos	AP - L calcif	spine		T2 +		neg
25	F	39	L	pos	pos	AP - L	spine		neg		neg
26	F	54	R	pos	neg	AP - L	spine		neg		neg
27	F	67	L	neg	pos	AP - L			neg		neg
28	F	64	L	neg	pos	AP - L			neg		neg
29	F	60	R	pos	pos	AP - L			neg		neg
30	F	68	L	neg	pos	AP - L			neg		neg

Source: Hospital Mário Covas Outpatient Facility and Private Practice. T 1= test 1 T 2= Test 2
F= female M= male R= right L= left pos = positive neg = negative
AP= Anteroposterior L= Lauesntein calcif = calcification
pos resonance= resonance positive for bursitis neg resonance = resonance negative for bursitis T2 + = positive test 2

statistical value P= 0.00104 proves the changes and the higher positive rate of test 2[6].

Figure 5 - *X-ray image of the hip at anteroposterior plane (AP) showing micro calcification at the major trochanter region (arrow).*

Figure 6 - *Local X-ray image evidencing a large calcification area at the major trochanter region.*

DISCUSSION

Defined as chronic or intermittent pain on the lateral region of the hip, trochanteric bursitis is a clinically diagnosed disease [7-10], which makes subsidiary tests useful only for ruling out degenerative bone diseases or tumors, among other conditions.

The main clinical characteristics associated to this disease, as described by literature, are exacerbated local pain resulting from forced abduction and weak hip abduction [9,10].

A bursa is a cushion acting like a bumper between bone protuberances and surrounding soft tissues. Bursal inflammation, or bursitis, may result from microtraumas, arthritis, muscular dysfunction, overuse or acute trauma [11]. Its differential diagnosis is broad, including lumbar, pelvic, inguinal, hip joint conditions, as well as local infection.

Although literature describes about 14 – 21 bursas at the trochanteric region,[7,9,11] painful pictures are usually attributed to only three of them, which are directly related to gluteus muscle anatomy.

These are described as follows: two major and one minor bursa; the larger trochanteric bursa is the gluteus maximum bursa, which is interposed between its fibers and the major trochanter. The other large bursa is the medium gluteus bursa, which is interposed between muscle tendon and the upper-lateral portion of the anterior trochanter surface. The smaller bursa, the one of the minor gluteus,

is interposed between this muscle's tendon and the medial portion of the anterior surface of the major trochanter.

In the study by Shbeeb et al.[8], for including cases for trochanteric bursitis treatment with glucocorticoids infusion, the following formula was employed as a diagnostic criterion: first two criteria (major) should be positive, as well as at least one of the three remaining criteria; 1) history of pain at the lateral hip surface; 2) sensitivity to palpation at trochanteric region; 3) irradiation to the lateral surface of the involved limb, or pseudo-limping; 4) pain at forced hip abduction; 5) pain at rotation ends, particularly in the Patrick-Fabere's test. In another study by the same author[9], describing the major trochanter painful syndrome, in 1996, the clinical criteria described for trochanteric bursitis diagnosis were again used, associating an imaging study for ruling out changes of other nature.

Although we don't have enough information to prove that trauma triggers a painful picture, there are some evidences that this does occur. In direct traumas or microtraumas caused by repeated action of local muscles in their insertion at the trochanter, local inflammation occurs, many times resulting in degenerative changes on tendons, muscles or other local tissues. Calcification may occur in these situations, both on gluteus muscle tendons and around trochanteric bone formation. Other conditions reported by literature concerning trochanteric bursitis, such as arthritis, limbs' asymmetry, lumbar spondylosis, also deserve further investigation in order to establish an accurate relationship among pathologies [9]. Many authors believe that conditions leading to local pain or restrained range of motion, of any other etiology, lead to an increased tension on hip's external rotator musculature. Thus, tension exerted by gluteus maximum fibers at iliotibial tract is increased, thus enhancing bursal rubbing and inflammation[9].

There are studies in literature recommending glucocorticoids infusion into the bursa as an alternative to conventional treatment (NSAID and physical therapy) for refractory cases, with symptoms relief after the procedure being regarded as diagnosis confirmation[7].

In medical literature, many authors have dedicated themselves to study this condition; however, most of them agree that diagnosis must be essentially clinical, based on complaints and propedeutics[7-9], with imaging diagnosis usually unnecessary [11].

The present study is dedicated to describe a new semiologic orthopaedic maneuver for peritrochanteric bursitis diagnosis assistance.

The maneuvers described and applied on patients, the so-called test 1 and test 2 intend to elicit and exacerbate, respectively, patients' complaints, pointing out what causes irritation on the affected anatomical site, by stretching and compressing the iliotibial tract and gluteus muscles on bursas. The tests showed that they are statistically different from each other, i.e., we are not repeating the same physical test; additionally, test 2 showed high and statistically significant sensitivity for peritrochanteric inflammation presence, because, in a maximum adduction situation it causes hyper-stretching of the iliotibial tract, especially of gluteus maximum and medium; however, it is not specific for bursitis, because our analysis is based on a previously established clinical diagnosis, creating a bias that may be questioned; nevertheless, in clinical practice, the same happens, i.e., we may be treating tendonitis of the abductors'insertion instead of bursitis, but the treatment would ultimately be the same. The semiologic tests studied here showed a high sensitivity degree, which was statistically proven. In addition, they complement each other, since they are different, proving to be useful for diagnostic assistance, always taking into account what is reported in literature, i.e., that the diagnosis of peritrochanteric inflammatory processes are provided after other joint conditions are ruled out. In our analysis, the study population behaved similarly to data available in literature, with incidence risks described between the fourth and sixth decade of life[9]. Schapira et al.[7] in a study involving 72 patients, found an age range of 34-79 years, which is consistent to our case series, which ranged from 32 to 80 years. We found that female gender is prevalent when compared to men (90 versus 10%), a data that was similarly found in other circumstances of this disease[7,8], but female prevalence in these studies was lower (66.6% and 82.6%, respectively). Shbeeb et al.[9]. report a female prevalence of 4:1.

There are no important citations in literature about affected side prevalence. We found a certain balance (46.7% right and 40% left hips) in that distribution. Possibly, the affected side has a close primary or secondary mechanical-postural relationship between hips, so that studies correlate previous ipsilateral pathologies, such as lumbalgia, osteoarthrosis and limbs asymmetry with trochanteric bursitis[7-11]. All assessed patients were submitted to X-ray studies (pelvis) in the first examination, aiming to rule out associated pathologies that could alone justify a painful picture. The detection of peritrochanteric calcification was found in 9 cases, or 30% of the patients, which exceeds the trochanteric calcification and bone irregularities findings in 12.5% of the cases reported by Schapira et al.[7]. There are no consistent data in literature to correlate calcification with severity of pain in bursitis patients.

We didn't find data significantly correlating the pathology with supplementary propedeutics (imaging tests). In our opinion, there is a trend in literature towards a clinical diagnosis for investigators of this disease, this being relatively simple and presenting a typical picture[4], so that a plain X-ray image is enough to rule out some potential differential diagnosis. Bird et al.[12] tested all the 24 patients complaining of peritrochanteric pain in their case series with magnetic resonance. The following were found: 45% of medium gluteus myalgia, 62% of medium gluteus tendonopathies, 2 patients with inflammation of the trochanteric bursa, and 1 patient with femoral head necrosis. Kagan[10] report in his studies that chronic pain lasting for months or years and refractory to clinical treatment showed at MRI the presence of rupture of the tendinous insertion of the medium gluteus next to major trochanter, requiring tendinous re-suturing with resistant wires and leading to clinical improvement, calling this injury condition as rotator cuff injury, similarly to the shoulder.

Thus, MRI can be useful when a diagnosis is unclear or when pain persists even with an effective therapy. In our study, MRI was applied to 4 patients, being positive to trochanteric bursitis in 3 of them (Figure 7); however, we believe that this kind of test – expensive and not always easily accessible in our environment – should be recommended in cases of questionable diagnosis or in cases refractory to traditional treatment.

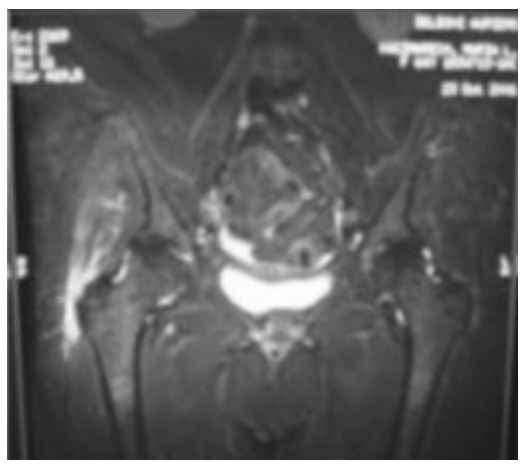

***Figure 7 -** NMR image at T2 showing peritrochanteric inflammatory aspect at right*

The primary care described in our study is the one most frequently reported in literature, involving NSAIDs and physical therapy. We were successful in the first follow-up visit in most of the cases (80%), and, in two cases, we had to infuse 2 ml of Xylocaine, 2% combined with 1 ml of betamethasone, thus obtaining resolution of pain complaints in refractory cases. Some studies mention as primary treatment to trochanteric bursitis the local infusion of glu-

cocorticoids (betamethasone or methylprednisolone) or anesthetic agent (xylocaine or lidocaine)[7,8,12] as well as correlating symptoms relief to diagnostic determination. Due to the improvement shown by patients in our study, with traditional treatment and sensitivity to the test, we preferred the clinical diagnosis and used local infusion, which we regard as less invasive, for refractory cases. Most of the studies mention a significant improvement of patients when appropriate diagnosis and treatment are provided (NSAIDs, physical therapy, infusions or combinations).

There are no important references available to compare the benefits of the variety of treatment modalities. Literature mentions osteotomies[4] and surgical resections of the bursa and associated calcifications[9,12], however, in our opinion, these are not routinely employed treatments, except in rare disabling cases refractory to clinical treatment.

The clinical tests demonstrated in this study were positive in most of the cases with positive traditional propedeutic assessment and clinical history pointing out to peritrochanteric bursitis. These are relatively simple and sequential, since test 2 begins with the patient maintained in the same final position of test 1, and because it shows better diagnostic sensitivity, exactly because it exacerbates primary pain, further evidencing the picture, both for patients and for investigators. We excluded from our study patients with other previous bone-joint pathologies in order to favor diagnosis accuracy of the tests being studied, but we remind that, many times, associations among conditions are frequent, and potentially related to each other. We advise that this test should be avoided in patients with recent hip arthroplasties, because the test with maximum flexion and adduction may lead to posterior dislocation, especially in arthroplasties performed through the posterior access.

CONCLUSION

Clinical investigation is the most important instrument for detecting peritrochanteric bursitis. The maneuvers described here are sensitive and supplementary, and may be used in the primary orthopaedic semiology of this condition.

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