National Council for NCOR Osteopathic Research

Evaluation of the hip joint – a snapshot summary (Nov 2012)

Key messages

- Although the literature frequently examines clinical tests in isolation, good practice and higher quality evidence strongly assert the need to use multiple tests in addition to other aspects of the consultation.
- The trendelenburg test may be limited in its use for assessing hip abductor muscle strength and in identifying patients with early osteoarthritis of the hip.
- FABER test has been shown to be sensitive in more than one study but its specificity has not yet been established. The test's inter-reliability has also been shown to be good.

Context

This is the starting point for all clinicians and excludes the presence of abdominal pathology or other systemic conditions that could contribute to symptoms in the hip and thigh region. Hip joint disease can co-exist with other pathologies, referred symptoms, secondary dysfunction, or other coincidental findings.

A variety of disorders can suggest a painful hip. Byrd and Jones[1] assert that although examination of the hip can be very reliable at detecting the presence of a problem, it may be poor at defining specifically the true nature of the underlying disorder.

Byrd[2] suggests that a history of a significant traumatic event is a good prognostic indicator of a potentially correctable problem, while an insidious onset is a poor prognostic indicator suggestive of degenerative disease or some other predisposition to injury.

Leibold *et al*[3] state that characteristic features to be considered for differential diagnosis vary depending on the age of the patient. In childhood, for example, disorders for differential diagnosis include congenital dysplasia, Legg-Calve-Perthes disease, and slipped capital femoral epiphysis. Leibold *et al*[3], explore further different differential diagnoses. These include the consideration of infectious conditions, traumatic conditions, inflammatory conditions, degenerative joint disease, neurological conditions, vascular conditions, metabolic conditions, neoplasms, and other causes including referred pain, corticosteroid use, alcoholism, psychosocial factors, and gynaecological disorders.

Physical examination

Byrd[2] stated that the physical examination should include:

Inspection Identification of antalgic gait in a patient when entering the treatment room

Observation of the patient's posture when standing and seating

Any protective postures to alleviate stresses on the hip

Any flexion of the symptomatic hip

Slouching to the symptomatic side when sitting

Gross atrophy of any muscle groups or other asymmetries

Measurement

Limb length from the anterior superior iliac spine to the medial malleolus.

Byrd[2] asserts that a discrepancy greater than 1.5cm can indicate a variety of chronic conditions.

Bilateral thigh circumference to assess for muscle atrophy

Range of motion recorded consistently and in a reproducible and comprehensible manner

Symptom localisation

The one finger rule – asking the patient to place one finger on the spot that hurts most

C-sign – patients will often cup their hand around the most symptomatic region

Palpation – this can be conducted systematically working from the lumbar spine, pelvic joints, along the iliac crest to the greater trochanter, and including muscle bellies.

Muscle strength – Byrd[2] states that although this is a crude measure of hip function, it can reveal useful information, and active resisted assessment can reproduce pain.

Log Rolling	Byrd[2] asserts this is the single most specific test for hip pain. The rolling back and forth of the hip moves the femoral head in relation to the acetabulum, and the absence of a positive log roll test raises the suspicion that the hip is not a source of symptoms.
Ober's Test	This test, first described in 1936, is a common and widely accepted test for measuring the length of the iliotibial band[4]. Ober first described the test with the knee flexed but additional literature failed to demonstrate an accepted standardised position for the knee. A cross-sectional comparative repeated measures design was undertaken to assess the influence of gender and knee position on Ober's test[4]. A sample of 49 asymptomatic participants were assessed using Ober's test with the knee flexed to 90° and extended to 0° for the right lower limb. The limb was lowered from abduction and the end point of hip abduction, or hip adduction was measured in relation to neutral[4]. The researchers found that the Ober test with the knee flexed limited hip adduction more than with the knee extended for both men and women, and women had greater limitations than men[4]. In this case, it could be argued that as the Ober test with the knee flexed and knee extended produced different results, they could be considered to be two distinct tests. Gajdosik *et al*[4] suggested that normative values for the two knee positions should be defined separately for men and women.
Thomas Test	The Thomas test, also known as the Kendall test, has been discussed in its various modifications by a range of authors in its application of assessing flexibility in the thigh region. Peeler and Anderson[5] undertook a descriptive test-re-test design to evaluate the clinical reliability of the test. Normative limits had not been established for rectus femoris flexibility prior to this study. A total of 54 participants completed the study. The rectus femoris was assessed for 90° flexibility using pass/fail, and goniometer scoring systems. A re-test session was undertaken ten days after the initial test phase. Statistical evaluation of the findings indicated generally poor levels of reliability for pass/fail scoring, and fair to moderate levels of reliability for goniometer data. Measurement error values demonstrated further the degree on intra-rater variance when conducting the test. Peeler and Anderson[5] concluded that the findings raise questions concerning the reliability of the modified Thomas test and provide new information concerning its reliability when assessing the flexibility of rectus femoris in a clinical setting.

Trendelenburg Test (TT)	Hardcastle and Nade[6] examined the significance of the Trendelenburg test (TT) in clinical practice. The test was originally described in 1897 at a time when clinicians had few diagnostic aids other than their senses. Hardcastle and Nade[6] identified four different methods of performing the test in standard texts. In their own study they examined 50 asymptomatic subjects, and 103 subjects with disorders of the spine or hip who were further subdivided into subjects with neurological disorders or mechanical disorders. Their study identified a means of standardising the test, and allowing interpretation of the test to assess hip abductor function. Hardcastle and Nade[6] used a standardised approach for the test by asking their subjects to stand initially with the non-stance leg flexed to 30°, and this was repeated with the leg flexed to 90°. Each posture was held for 30 seconds. Postures were recorded using photography, videotape, electromyography, and assessment of abductor muscle power. The study found that three different patterns of movement occurred in the spine and pelvis. These were: ➢ The pelvis rising on the non-stance side with a compensatory scoliosis convex to the stance side, classified as a negative TT. ➢ The pelvis remained parallel to the ground with minimal spinal compensation ➢ The pelvis dropped on the non-stance side accompanied by downward movement of the buttock crease with associated abduction of the weight bearing hip, and compensatory scoliosis convex to the stance side. This was classified as a positive TT. The authors noted that the major issues arising from the test focused on misinterpretation. These included false positive responses arising from pain, lack of patient cooperation, and impingement between the rib cage and the iliac crest. False negative responses resulted from patients using muscles from above and below the pelvis, and from leaning beyond the hip on the stance side. Kendall et al[7] recently conducted a study to investigate the validity of this test using an ultrasound-guided nerve block (UNB) of the superior gluteal nerve to determine whether or not the reduction in hip abductor (HABD) muscle strength would result in the mechanical compensatory mechanisms expected in a positive test. After testing 9 healthy males the authors found that despite an average strength reduction of 52% of HABD muscles following the UNB, no significant mechanical changes could be seen during the test. Youdas et al[8] concluded that TT was not useful in identifying patients with early hip OA due to poor validity of the test when they compared a group of patients with mild OA to a healthy group. Furthermore, Kendall et

	al[9] found in their earlier study of patients with non-specific low back pain that the TT did not show a correlation between HABD strength and the amount of mechanical pelvic drop in the test. They suggested that there may be other factors controlling pelvic stability.
Ely's Test	Ely's test is one of many used to assess flexibility of the rectus femoris (RF) muscle. Its reliability as a clinical tool was assessed by Peeler and Anderson[10]. They employed experienced clinicians to use Ely's test in a test- re-test design to assess RF flexibility and evaluated this using pass/fail and goniometer scoring systems. Statistical analysis of the findings led the researchers to call into question the statistical reliability of Ely's test. This provides practitioners with helpful information on the reliable limits of the test when used in a clinical setting.
FABER (Patrick's test)	Maslowski et al[11] carried out four hip pain provocation techniques on 50 subjects prior to them receiving an anaesthetic injection into the hip joint. They used the FABER test, Stinchfield manoeuvre, Scour manoeuvre (quadrant test) and internal rotation with over pressure (IROP). They found that the FABER test was sensitive in identifying intra-articular hip pathology but was not shown to be specific due to the study design and therefore could not yet be relied upon to be negative in patients without hip pathology. Martin and Sekiya[12] undertook an evaluation of four clinical tests used to assess individuals with musculoskeletal hip pain. They evaluated inter-rater reliability of the FABER test, flexion- internal rotation-adduction impingement test, log roll test, and the palpation of the greater trochanter for tenderness. A total of seventy symptomatic subjects (mean age 42 years) were evaluated by an orthopaedic surgeon, and physical therapist. Their diagnoses included degenerative joint disease, labral tear, femoroacetabular impingement, capsular laxity, trochanteric bursitis, iliopsoas tendonitis, and adductor strain. Statistical evaluation was undertaken on the findings of the tests. Martin and Sekiya[12] concluded from their findings that the FABER test, log roll test, and assessment of greater trochanteric tenderness showed a fair level of agreement. Low reliability was found for the flexion- internal rotation-adduction impingement test.
Internal rotation with over pressure (IROP)	Maslowski et al[11] found IROP to be the most sensitive test of the four used in their study described above However, as with the FABER test it was not shown to be specific.

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