

Information for Delegates

Migratory Fascia Syndrome and Lelean's Ligament

World Congress on Low Back and Pelvic pain

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Author; Peter Lelean. Email - bakguru@yahoo.com.au

Peter Lelean is a Remedial Massage Therapist.
Peter has taught advanced remedial techniques around Australia and overseas.
He runs a clinic in Frankston, Victoria.

"Chronic Fatigue Syndrome" Australian Therapeutic & Bodywork Journal May 1996 P. 19
"The assessment of Idiopathic Scoliosis as a Dynamic Lesion" Massage Australia Journal,
issue 36 2001 pp 34-39

Poster presentation, World Low Back Pain Congress, Melbourne Nov 2004

Poster Presentation, Fascia2007, Harvard Medical School, Boston, USA

"Migratory Fascia Syndrome" Massage Therapy Canada, Spring 2009, P. 28

*Lelean, P., The migratory fascia hypothesis. Journal of Bodywork and Movement
Therapy(2008), doi:10.1016/j.jbmt.2008.06.009*



In 2003 the author sought to identify more accurately those soft tissue elements that seemed to be involved in lumbopelvic pain. This investigation suggested that a commonly identified strain pattern in the gluteal area been misinterpreted as a problem in the gluteal muscle fibres, presumed to be resulting from misalignment of the sacroiliac joint. While this view was supported by symptomatic relief gained by realigning the S.I.J. and treating the adjacent muscle issues, subsequent relapses in back pain treatments indicated a “missing key”. The “strained element” running approximately parallel to the iliac crest on the posterolateral aspect is shown by discriminatory palpation to be part of Scarpa’s fascia when it has been subjected to intolerable tension.

Migratory Fascia Syndrome” (the author’s term) exists when a number of defined symptoms occur as a result of Scarpa’s fascia dragging posteriorly across the iliac crest. These symptoms may include, but are not limited to, pain in the ilio- lumbar region, gluteals, TFL and iliac fossa tenderness, and pain in the shoulder region. The taut, string-like element is presently described as a fibrous development of the fascia.

This element of Scarpa’s fascia palpated on the gluteus medius area normally lies immediately anterior to the iliac crest, but can move as described to a position up to 2 cm postero-inferiorly to the crest.

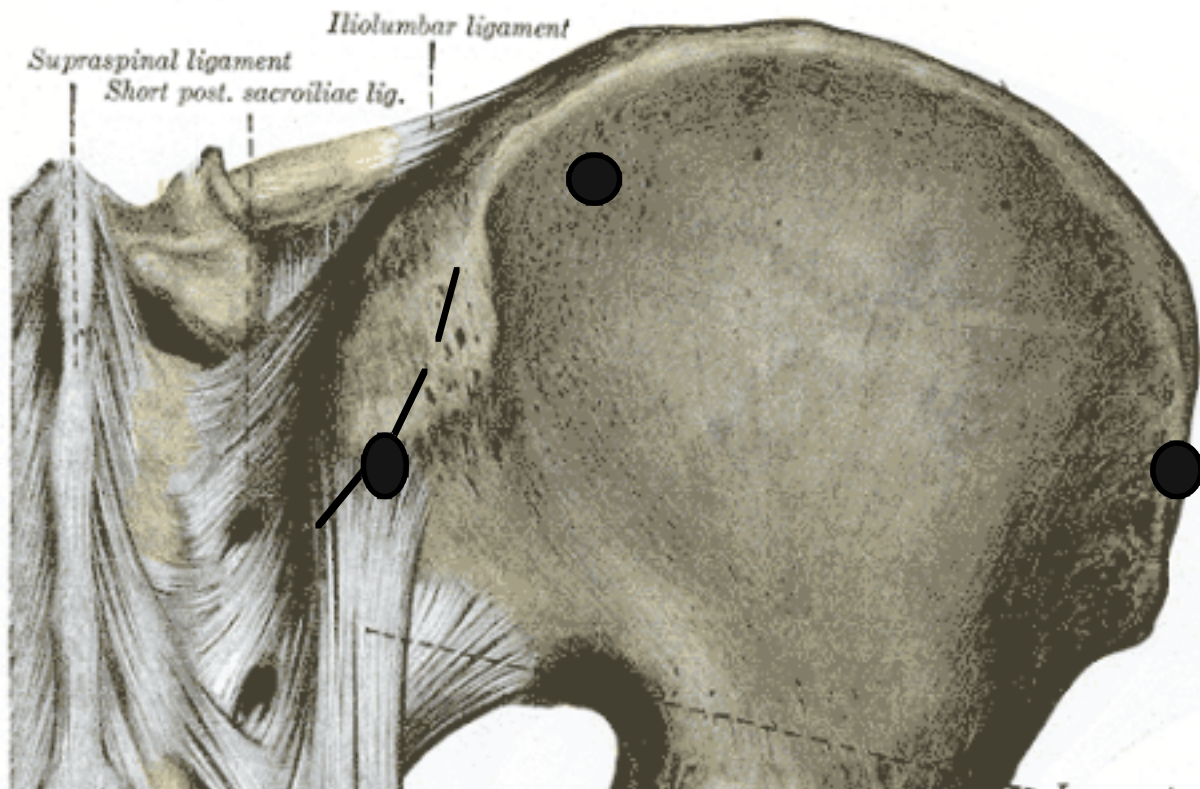
Treatment Goal

In clinical practice the goal is, subsequent to determining that the pelvic bony structure is again in alignment, to relocate this fibrous element (Lelean’s Ligament) in its correct position immediately adjacent to the supero-anterior aspect of the iliac crest. A “snick” sound is sometimes heard as this occurs, and pain symptoms lessen immediately.

Clinical experience reveals that there are three distinct types of migration, each involving a different sector of the crest. Paradoxically, each segment, whether it seems to be deflected or not, needs to be treated in order to achieve a sound realignment of the fascia.

WARNING! The contents of this document are not advice or instruction. Treating Migratory Fascia Syndrome without specific techniques developed by the author may result in severe injury to the patient.

NB. Since these notes were written for the 2004 LBP Congress, several other sites of fascial migration have been identified.



How can I palpate the element?

Patient is sidelying, head comfortably supported, upper leg flexed. Palpate the regions as marked by dots on the diagram. In the **correct** position at **PSIS**, the element is **not palpable**.

The element **is** palpable at the anterior site when migrated.

In the normal alignment, the element is palpable on the anterosuperior aspect of the iliac crest, between the quadratus lumborum lateral border and the anterior insertion.

The crest is very sensitive to excessive pressure, particularly at transit points for the cluneal nerve branches. Note any fascial ridging from ASIS to PSIS.

In certain cases it will be neither possible nor appropriate to manipulate the migrated fascia back into position.

Fascial migration in this area affects strain patterns throughout the body, and is therefore also a key to dealing with diseases other than back pain. These include fibromyalgia, migraines, scoliosis, osteitis pubis, abdominal neurological imbalances.

ANATOMY

One role of the described superficial fascia is to assist in counteracting the compressive shearforce exerted on the sacroiliac joint. The fascia transmits tension up to the crest, then passes posteriorly then caudally. In this way the iliac crest provides an elementary mechanical advantage, the convex flare being able to maintain a homeostatic tension through the range of femoral movement. A helpful analogy is that of the bridge on a violin, which maintains tension on the elements passing over it.

Whereas the anterolateral abdominal wall is contractile and distensible, the posterior abdominal wall is bulky and stable by comparison.

To assist in keeping the fascia correctly positioned, given the difference in posterior/anterior overall extensibility, there is to be found lying immediately anterior and parallel to the iliac crest a thin fibrous element that extends from the lumbosacral junction laterally, first passing the anterosuperior aspect of the PSIS, then continuing in the described orientation to finally merge with the upper portion of the inguinal ligament. It is possible to conclude that this element is one of, or an adaptation of, the yellow elastic fibres contained in the fascia of Scarpa.

(Reference 1)

Etiology

When, as the result of trauma, or certain awkward movements of the leg (for example getting out of a low car), the strain exerted on the lumbar anatomy is such that the fibrous element (say, the iliac crest ligament) is drawn posteriorly across the resistance of the crest, it may snap to a new position on the posterior aspect of the thigh. This movement can be the result of at least two influences – there may be a pre-existing pelvic obliquity incorporating a misaligned SIJ, putting more strain through one side; there may also be a tearing of the crural fibres in the iliac fossa, releasing tension from the anterior fascial structure. (References 6,7). This latter phenomenon incidentally gives rise to sensations in that area that mimic other pathologies e.g. hernia, and indeed may contribute to them over time. In the new position Lelean's ligament appears as, and has understandably presumed to be, a tight section of lumbar muscle.

However, the chord distance between origin and insertion is now shorter, with a resultant alteration in strain patterns. The author suggests that this lesion affects the fascial tensions in the entire thorax. Clinical experience shows for example a clear link between Migratory Fascia Syndrome and Thoracic Outlet Syndrome, usually on the contralateral side.

With the lumbar fascial balance disturbed, force closure across both sacroiliac joints is now dissimilar, allowing shear forces to produce misalignments (Reference 8). Equally, misalignments can also result from torsion coupled with shock load transmitted through the pelvic structure. Altered strain patterns affecting the contiguous exit foraminae can produce pains that mimic those of discogenic origin. One example is the pain picture associated with traumatised cluneal nerves as they pass across the iliac crest, clearly exacerbated when the fascia is disturbed. (References 2,3,4,5,6,7,8)

References and discussion

REFERENCE 1 Gray, Henry

Anatomy of the Human Body 1918

"The deep layer (fascia of Scarpa) is thinner and more membranous in character than the superficial, and contains a considerable quantity of yellow elastic fibers. It is loosely connected by areolar tissue to the aponeurosis of the Obliquus externus abdominis, to which it is connected by delicate areolar tissue, and reflected downwards and outwards. It is thin, aponeurotic in structure, and of considerable strength" (p. 709);". . . "above, it is continuous with the superficial fascia over the rest of the trunk; *below and laterally, it blends with the fascia lata of the thigh a little below the inguinal ligament; medially and below,* Author's italics*

Discussion

Specimen examination reveals that the attachment is about one third of the length of the inguinal ligament distal from ASIS. The vulnerable area in femoral hyperextension and external rotation is that of the connection by "areolar tissue to

the Obliquus externus abdominis,” an area often presenting palpable evidence of microtrauma in the studied cases of lumbar pain.

REFERENCE 2 Hirschberg GG, Froetscher L, Naeim F.

Arch Phys Med Rehabil. 1979 Sep;60(9):415-9.

Iliolumbar syndrome as a common cause of low back pain: diagnosis and prognosis.

“Most cases of low back pain fall into the category of nonspecific low back pain in which no specific pathology can be detected by x-ray, laboratory tests, or biopsy. In the authors' experience *about 50% of the patients falling into this group have a clinical picture characterized by symptoms and signs localized at one iliac crest.**

The symptoms can be abolished temporarily by infiltration of the posterior iliac crest with lidocaine. Because of the location of the findings and the unknown etiology the term iliolumbar syndrome is suggested. Distinguishing the iliolumbar syndrome from the root irritation syndrome may avoid unnecessary surgery. Chronic iliolumbar syndrome is a frequent cause of permanent low back disability, a fact not commonly recognized.” **Author's Italics*

REFERENCE 3 Maigne JY, Maigne R.

Arch Phys Med Rehabil. 1991 Sep;72(10):734-7.

Trigger point of the posterior iliac crest: painful iliolumbar ligament insertion or cutaneous dorsal ramus pain? An anatomic study. “The iliac insertion of the iliolumbar ligament is inaccessible to palpation, being shielded by the iliac crest. The authors conclude that the trigger point sometimes localized over the iliac crest at 7 cm from the midline likely corresponds to elicited pain from a cutaneous dorsal ramus originating from the thoracolumbar junction rather than from the iliac insertion of the iliolumbar ligament.”

Discussion

Pain in the iliac crest area is often related to distension in the superior cluneal nerve branches as they cross the crest. This may occur as a result of increased tension in the lateral thigh myofascia. This exists as a consequence of locally originating stress (as in a corkscrew thigh), or as a compensatory strain initiated by an innominate upslip on the contralateral side. This compensatory strain will be detectable along fascial pathways related to the lumbodorsal area. Pressure on the cluneal nerve branches may be exacerbated by fascial migration, in which Scarpa's fascia in the iliac fossa is dragged posteriorly over the iliac crest. The extent of this fascial movement can be assessed by palpating Lelean's Ligament. This element of Scarpa's fascia normally lies immediately anterior to the iliac crest, but can move as described to a position up to 2 cm postero-inferiorly to the crest. It is usually mistakenly interpreted as a taut gluteus medius, but a thorough trace of origin, insertion and orientation shows that it cannot be so. The mechanisms which produce this fascial movement are dealt with elsewhere.

REFERENCE 4 Vanderschot P., Schepers E., Broos P.

Folia Traumatologica Belgica 2002, 67-76.

Morbidity of Iliac Crest Bone Graft Harvesting

“However, in up to 10% of patients the nerve takes an anomalous course [3, 8]. Ghent [9] and recently Murata et al. [10] identified four anatomical patterns of the lateral femoral cutaneous nerve. *The nerve can pass over the iliac crest as much as 2 cm lateral to the anterior superior iliac spine,** placing it at risk during anterior iliac bone harvest, either from a poorly placed incision or overzealous retraction.

Placing the skin incision at least 2 cm dorsal to the ASIS, reducing dissection along the inner iliac wall and gentle iliac muscle retraction will minimize the risk of iatrogenic neuropathy.” **Author’s italics*

Discussion

The author has also found occasional pain representations that suggest a gross fascial movement across the ASIS which over time has resulted in adaptive thickening of the fascia, and related muscle distortion. It is possible that the “anomalous course” corresponds to a fascial shift in the same direction. As a preoperative caution it may be useful to first determine if a pelvic imbalance exists, and whether it should be corrected prior to surgery. Such a precaution enables better tissue healing and cohesion, in addition to enhanced patient comfort. The author has tested this approach on a nulliparous 19 y.o. preparing for an extensive bowel resection.

REFERENCE 5 Deanchou, M.D., Phillip B . Storm, M.D., James N. Campbell, M.D.
J Neurosurg (Spine 1) 1:87–89, 2004

Vulnerability of the subcostal nerve to injury during bone graft harvesting from the iliac crest.

We performed anatomical studies to describe the range of positions of the subcostal nerve in relation to the iliac crest. To ascertain the origin of the nerve, dissections were carried up to the spinal column. It was confirmed that the nerve originated below the T-12 pedicle, confirming its identity as the T-12 subcostal nerve. The nerve was found to exit the external oblique muscle above the iliac crest, course downward, and traverse the iliac crest below the Scarpa fascia and above the fascia lata.

Discussion

The reference to the apparent ability of the fascia to migrate has clear implications for nerves in the affected region. The reference by recent authors in the field to the visco-elastic, innervated, smooth-muscle attributes of fascia are relevant to the understanding of the role of fascial strength around the innominate area.

REFERENCE 6 DonTigny, Richard L., PT
www.kalindra.com/dontigny_lumbo.pdf

Function of the Lumbosacroiliac Complex as a Self-Compensating Force Couple with a Variable, Force-Dependent Transverse Axis: A Theoretical Analysis

“As the abdominal muscles are relaxed when standing automatically contract when leaning forward, they frequently fail to provide adequate anterior pelvic support in the transition to and from the trunk-forward position.

Failure to voluntarily contract a strong abdominal muscle group or inability to contract a weak muscle group predisposes the sacroiliac joints to injury from an anterior rotation of the innominates, even through minor trauma.

This may occur when leaning forward *if the innominate bones lack support* and rotate downward anteriorly and upward posteriorly around an acetabular axis immediately prior to a trunk moving forward, or, when lifting if the trunk extends on the anteriorly rotated innominate bones. Anterior rotation dysfunction may also occur during coughing or straining if the increased intra abdominal pressure spreads the innominate bones and anteriorly rotates them on the sacrum.”

* *Author’s italics*

“Lack of anterior pelvic support allows the innominates to rotate anteriorly on an acetabular axis loosening the sacrotuberous and sacrospinous ligaments and

decreasing self-bracing and friction.

The innominate shears cephalad and laterally on the sacrum at the posterior superior iliac spine and downward anteriorly at the S.1 segment.

The rapid release of balanced force in this complex may cause a sudden stress on the paravertebral extensors, the hamstrings, piriformis and other related structures.

The superficial long posterior sacroiliac ligaments are particularly vulnerable.”

Discussion

The free borders and attachments of Scarpa's fascia are arranged to permit normal movement while simultaneously providing an opposing force to that exerted by trans-pelvic groups such as iliopsoas. During a kinetic load as in a heavy landing, the resultant caudally-travelling force is partly mediated within the context of a reactive tightening of the abdominals which provide augmented resistance across the iliac crest and into the lumbar fascia. This opposes the force stretching the iliopsoas (and generating shear force), with the effect of shock absorption. This strain pattern also occurs in heavy lifting and is partly responsible for inguinal herniation. The mechanical advantage provided by the simple leverage of the fascia over the crest helps to balance the relative delicacy of the marginal crural fibres with the high loads developed in the distal posterolateral fascia. This balance is distributed through the fascia in a supportive way by the shape of the iliac crest, which is vectored to the aponeurotic anchor around the greater trochanter. This is by no means the only pathway of load dispersion, but illustrative in appreciating the biomechanical picture.

Disturbance of the transpelvic strain patterns can have repercussions through the whole body, in every system. The treatment of disease is incomplete unless the pelvic bony structure and fascia are in synergistic alignment.

An increasingly sedentary lifestyle in the western world may well lie at the heart of problems in pelvic floor weakness, abdominal recruitment prior to lifting, standing and sitting, besides the obvious issues related to obesity.

Increased intra-abdominal pressure resulting from a number of causes, either systemic (e.g. obesity) or transient (coughing), can distend the abdominal fascia on the lateral aspect around the iliac crests, leading to immediate fascial derangement as described earlier. A shortened iliopsoas group can impact on lumbar nerve conduction (as evidenced by a slump test), and may well change the coordination of trunk movements that depend on accurate proprioceptive response. Structural misalignment further complicates the scenario.

Reference 7 Lacroix VJ, Kinnear DG, Mulder DS, Brown RA.

Department of Family Medicine, McGill University, Montreal, Quebec, Canada.

Clin J Sport Med. 1998 Jan;8(1):5-9.

Lower abdominal pain syndrome in national hockey league players: a report of 11 cases.

PURPOSE: Groin injuries are a major diagnostic and therapeutic challenge in sports medicine. The aim of this review is to describe the clinical and surgical findings associated with an atypical lower abdominal pain syndrome occurring in elite ice hockey players. **CASE SUMMARIES:** Eleven professional ice hockey players from various National Hockey League teams were referred to the Montreal General Hospital between 1989 and 1996, suffering from atypical refractory pain and paraesthesia in the lower abdomen. Despite the use of conventional

investigative procedures such as physical examination, ultrasound, bone scan, computed tomography scan, and magnetic resonance imaging scan, preoperative findings were consistently negative. Operative findings revealed varying degrees of tearing of the external oblique aponeurosis and external oblique muscle associated with ilioinguinal nerve entrapment. Repair of the external oblique tear, ablation of the ilioinguinal nerve, followed by a 12-week planned course of physiotherapy allowed all to return to professional ice hockey careers.

DISCUSSION: While soft tissue injuries are the most common cause of groin pain in the athlete, tears of the external oblique aponeurosis and superficial inguinal ring have rarely been cited as a consistent cause of lower abdominal pain in athletes. Inguinal nerve entrapment is also rare in patients without a history of previous lower abdominal surgery. **RELEVANCE:** These 11 cases emphasize the importance of including another diagnostic possibility in the differential diagnosis of chronic overuse injuries of the lower abdomen.

Discussion

Lesions occurring in the iliac fossa are liable to exacerbation with concurrent fascial migration syndrome. The changed strain pattern increasing medially along the PSIS - ASIS axis adds tension to the traumatised area.

REFERENCE 8 Schamberger, Wolf

The Malalignment Syndrome - Churchill Livingstone 2002 pp 262-263

"The (sacroiliac) belt was developed to enhance the stability of the S.I. joints and symphysis pubis and has proved effective in reducing pain from these sites (Walheim 1984). Athletes wearing the belt have spontaneously reported a decrease in pelvic pain, increased comfort sitting, a tendency for the back to be straighter when sitting, and a feeling of increased pelvic girdle strength and stability.

The belt also appears to be effective in decreasing the frequency of recurrence of malalignment, if not preventing it altogether, once correction has been achieved. . . Cadaver studies suggest that the belt can increase the friction coefficient, and hence the stability of the SI joint, by bringing the apparently matching valleys and elevations on the sacral and iliac surfaces closer together (Vleeming et al 1990b). It is, however, hard to conceive of a belt that is applied just snugly enough to prevent it slipping up or down actually being capable of mechanically decreasing or stopping any movement of the pelvic bones"

Discussion

The author acknowledges that it is indeed hard to conceive such a belt.

The fresh critical evaluation of the soft tissue surrounding the iliac crest has found what seems to be a fundamental structural element whose role is subtle in performance and critical to whole-body fascial integrity.

Lelean's ligament is the natural "sacroiliac belt" that behaves just like other belts. If the fascia can be visualised as a garment that envelops the lower extremities, then the need for a securing mechanism becomes clear particularly as the pelvic junction is a busy crossroad.

The comparatively minor tension carried by this ligament is possibly related to the vulnerability of the inguinal attachment, and to the main load being carried by the iliolumbar and inguinal elements.

The mechanical advantage of the ligament's position also lessens the need for a thicker element, whose development is presumed to be mediated by yellow fibre adaptive response.

Another role of Lelean's ligament is to maintain even distribution of fascial tension across the iliac crest, which would conceivably assist accurate proprioceptive function as the fascial tensions in that area undulate during movement. Taking the "belt" analogy a little further, if the belt slips on one side the lateral balance across the lumbosacral junction is disturbed, with implications of splinting by other lateral elements such as piriformis and gemellus, and rotational forces on the dura. The complexity of this subject allows for endless discussion, but here the author rests his case with the reader.

WARNING! The contents of this document are not advice or instruction. Treating Migratory Fascia Syndrome without specific techniques developed by the author may result in severe injury to the patient.

Contact the author; bakguru@yahoo.com.au

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