

Ilioinguinal nerve entrapment: a little-known cause of iliac fossa pain

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Summary: The ilioinguinal nerve entrapment syndrome is an abdominal muscular pain syndrome, characterized by the clinical triad of muscular type iliac fossa pain with a characteristic radiation pattern, an altered sensory perception in the ilioinguinal nerve cutaneous innervation area, and a well-circumscribed trigger point medial and below the anterosuperior iliac spine. Relief of pain by infiltration of a local anaesthetic confirms the diagnosis.

This report describes retrospectively the clinical picture of ilioinguinal nerve entrapment in 32 mainly non-surgical patients. In 14 cases a definite diagnosis was established and in 18 patients the diagnosis was considered probable. The mean delay in diagnosis was 12.8 months. Better knowledge of this syndrome may avoid invasive investigations and be cost saving.

Introduction

The syndrome of the rectus abdominis muscle is a well known abdominal muscular pain syndrome caused by entrapment of the medial cutaneous branch of the 7th–12th intercostal nerves.^{1,2} Ilioinguinal nerve entrapment causes a little-known type of abdominal pain frequently giving rise to confusion with gastrointestinal, genito-urinary and orthopaedic disorders.^{3–5} The ilioinguinal nerve, originating from L1–2 nerve roots, has a course and function similar to the intercostal nerves. It innervates the lowest portions of the transversus abdominis and internal oblique muscles and the skin over the inguinal ligament, the base of the scrotum or labia and the inner upper part of the thigh. Entrapment occurs at the point where the nerve pierces in a steplike or zig-zag fashion the transversus abdominis muscle and the internal oblique muscle, 2 to 3 cm medial and slightly below the anterosuperior iliac spine.^{3,4,6}

The ilioinguinal nerve entrapment syndrome is characterized by iliac fossa pain with muscular pain characteristics and radiating to the groin, the proximal parts of the scrotum, the labia majora, the upper inner part of the thigh and the back. A second feature is hyper-, hypo-, or dysaesthesia in the area of its cutaneous distribution. The third feature is the presence of a trigger point medial and below the anterosuperior iliac spine. Definite diagnosis can be established by relief of the pain by infiltration with a local anaesthetic.^{4,5} In some patients weakness of the

abdominal wall resulting from denervation muscular atrophy may give rise to bulging of the lower abdominal wall.^{4,6,7}

Ilioinguinal nerve entrapment has been reported as a complication of certain lower abdominal surgical procedures.⁵ Reports of non-post-surgery ilioinguinal nerve entrapment are very scarce.^{3,7,8} We report our experience with this little-known syndrome of iliac fossa pain in a non-surgical population.

Patients and methods

Patients in whom the diagnosis of ilioinguinal nerve entrapment was established in the outpatient clinic of the department of general internal medicine and the emergency department of the university hospital form the basis of this study. The clinical diagnosis was based on: (1) the pain characteristics pointing to a muscular pain (i.e. influenced by ambulation and or exertion) and/or the typical radiation pattern (back, groin, inner upper part of the thigh and the proximal part of the scrotum or the labia majora); (2) the finding of cutaneous hyper- or dysaesthesia; (3) the presence of the typical trigger point 2–3 cm medial and below the anterosuperior iliac spine.^{4,6}

The file number was noted in a special register at the time of the first contact with two of us (D.C.K., H.J.B.). Atypical cases have not been registered. The data were not recorded in a structured data collection form.

The records of these patients were retrospectively

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analysed. In addition to at least two or three of the clinical characteristics, relief of pain by infiltration of a local anesthetic was required for cases to be classified as definite. Cases were defined as probable when a muscular type of pain was present in addition to the clinical finding of abnormal sensation and the typical trigger point.

Standard electromyographic techniques were used to determine the sensory conduction velocity of the ilioinguinal nerve and signs of denervation in the lower transverse abdominal muscles.

Results

During a 5-year period (1984–1988) 32 patients with a clinical diagnosis of ilioinguinal nerve entrapment were seen. In 14 cases (group 1) the diagnosis could be considered definite and in 18 patients (group 2) the diagnosis was probable. The mean age was 37 years (range 15–74), 38.7 ± 15.7 years (mean \pm s.d.) in the first and 34.6 ± 15.6 years in the second group. Thirty one were female and one male belonging to group 1.

The pain characteristics are given in Table I. All patients mentioned at least one of the features of the radiation pattern or one of the aggravating factors. The mean duration of pain was 12.8 months varying from one day to 30 years. Excluding the patient with a definite diagnosis established after 30 years the mean duration was 13 ± 13.8 months (mean \pm s.d.) in the first group and 18 ± 29.9 months in the second group. In two of the four patients who had undergone

appendicectomy the pain commenced after surgery. In three of the 9 patients who underwent gynaecological surgery (1 of group 1 and 2 of group 2), operation had been performed because of entrapment pain. In one patient of group 1 a kidney stone was operatively removed because of a presumed relationship of the pain to the kidney stone.

The investigations performed before presentation in our hospital included laparoscopy in 2 patients of group 1 and outpatient visits or hospital admission in 6 patients of group 1 and 8 of group 2. Ten patients of group 1 and 12 of group 2 underwent a more or less intensive exploration at the time of presentation: pelvic examination by a gynaecologist in 9 cases, urological consultation (2), X-ray of the spine (7), urography (7), ultrasonography (9), barium enema (6), barium follow-through (5), computed tomography scan (2), colonoscopy (3) and Meckel scintigraphy in 3, a total of 53 tests in 22 patients. In 4 patients of group 1 and 6 of group 2 we tried to identify the ilioinguinal nerve entrapment by electromyographic techniques but in 8 cases this failed due to difficulty in localizing the nerve. The sensory latency time was increased in one patient of group 2 and in one patient of group 1 stimulation of the ilioinguinal nerve provoked the typical pain. Local infiltration with 5 to 10 ml lidocaine was performed in 19 patients and proposed to the referring doctor as treatment for the other 13 patients. Thirteen out of 19 patients had an immediate complete relief of pain and 1 patient had a partial amelioration. In the remaining 6 patients the effect was not stated in the medical record.

Table I Pain characteristics of ilioinguinal nerve entrapment

	<i>Definite diagnosis</i> n = 14	<i>Probable diagnosis</i> n = 18
<i>Pain localization</i>		
Right iliac fossa	12	12
Left iliac fossa	2	6
<i>Radiation pattern</i>		
Groin and thigh	9	10
Back	8	3
Testis	1	0
No radiation	1	0
Not stated	2	8
<i>Predisposing factors</i>		
Appendicectomy	0	2
Pregnancy	0	2
Vomiting	0	1
Weight change	2	0
<i>Aggravating factors</i>		
Position and walking	10	10
Position during sleep	4	3
Menstruation	0	2
Increased abdominal tension	2	2
Not stated	4	6

Discussion

The ilioinguinal nerve entrapment syndrome has received little attention in the literature and seems to be little known.^{3,4,7} The incidence cannot be determined from our study but seems not to be rare. Mummenthaler *et al.* reported on seven patients seen during a period of several months.⁷ Another report described 23 cases following common lower abdominal surgical procedures.⁵

The preponderance of right fossa localization (75% of our cases) might be explained by referral bias caused by the suspicion of appendicitis in case of right fossa pain. Chronic left fossa pain will easily be ascribed to irritable bowel. Analysis of the predisposing and aggravating factors does not explain the enormous female preponderance in this series. The weaker abdominal muscles and more downward angulation of the pelvis in females, increasing the distance the nerve has to travel, might predispose to nerve damage.⁴

The diagnosis of ilioinguinal nerve entrapment may be suggested by the duration of the complaints in patients who otherwise look well and have already undergone many investigations. Thirteen of our 32 patients had complaints lasting two years or more. In this situation the clinician has to resist the tendency to make a diagnosis of a psychosomatic disorder. A meticulous history will reveal the first element of the clinical triad, i.e. the pain characteristics and radiation pattern. Worsening of the pain by ambulation, exertion, hyperextension of the hip, abdominal distention (pregnancy, Valsalva manoeuvre) and sleep position and relief of pain by flexure of the hip or forward inclination of the trunk suggest the diagnosis of a muscular type of pain. The radiation pattern to the back, the genitals, the groin and the thigh points to ilioinguinal nerve damage. Retrospective analysis of standard medical records does not allow us to draw meaningful conclusions concerning the relative frequency of the different radiation patterns and the aggravating factors. In agreement with other authors we could elicit a history of relevant injury to the region only in a minority of our patients.^{4,7} However, surgery of the lower abdomen, mainly appendectomy, hernia repair and hysterectomy, predisposes to damage of the ilioinguinal nerve.⁵

The physical examination reveals the second element of the clinical triad, altered cutaneous sensation in the area above the inguinal ligament. Cutaneous hyperaesthesia and dysaesthesia was found in all our patients. Hypoaesthesia is more difficult to evaluate in this area and is present if the neuropathy has been of sufficient intensity for a long enough period.⁴

An important requisite for making the diagnosis of a muscular pain is the presence of a localized point of maximal tenderness on pressure with an obvious pain reaction either verbally or by withdrawal response.¹

The trigger point of the ilioinguinal nerve entrapment syndrome is a narrowly circumscribed area ('one to two fingers') 2 to 3 cm medial and below the anterosuperior iliac spine (below the line between the umbilicus and the anterosuperior iliac spine). At this point the ilioinguinal nerve pierces in a step-like fashion the transversus abdominis muscle and the internal oblique muscle and may be 'entrapped'. This finding constitutes the third element of the clinical triad. Extension of the rectus abdominis muscle seldom induces pain but forced flexion of the hip against resistance is the best manoeuvre to induce pain.

Definite diagnosis can be established by immediate complete relief of pain by local infiltration of 5 to 10 ml lidocaine 1% at the trigger point deep in the muscular layer.^{4,5} Infiltration of the subcutaneous fat will not relieve the pain. A very rare case of ilioinguinal nerve irritation may be due to more proximal compression of the nerve by, for example, enlarged abdominal lymph nodes. In these cases infiltration will also fail. Infiltration is recommended if either the physician or the patient is not convinced of the clinical diagnosis. Knowledge of the typical clinical triad and the effect of local infiltration obviates the need for an extensive investigation. Six of our patients had undergone surgical procedures for this pain syndrome and numerous investigations were done before and at the time of our examination.

We did not assess the longterm therapeutic effect of local infiltration. Pain relief for days to weeks ensues from lidocaine infiltration. The mechanism of the long lasting relief of neuralgic pain by lidocaine is not known.¹¹ Some of our patients returned and were treated successfully with another infiltration. Some patients were reassured after explanation of the benign nature of their complaints and did not want more treatment. No patient needed neurolysis. Entrapment neuropathy following surgical procedures frequently has to be treated by neurectomy.^{5,7}

Objectifying the entrapment of the ilioinguinal nerve by electromyographic techniques seems to be difficult, at least in our hands. No literature data on this point are available. Further research on this elegant diagnostic technique is necessary. The differential diagnosis of ilioinguinal nerve entrapment includes entrapment of the neighbouring iliohypogastric(L1-Th12) and genitofemoral(L1-L2) nerve and the rectus abdominis muscle syndrome.^{1,5,9,10} In case of doubt gastrointestinal, genito-urinary or orthopaedic investigations must be performed.

We suspect that the ilioinguinal nerve entrapment is a common but little-known syndrome. Knowledge of the typical clinical characteristics and the effect of infiltration with a local anaesthetic will allow rapid relief of frequently longlasting pain with a minimum of costs and discomfort for the patient.

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