CASE REPORT

Focal osteopenia of pubic parasymphyseal bone as an underlying cause of groin pain in sports: a new perspective

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SUMMARY

Groin pain is a common problem in athletes. The diagnosis can be difficult because of the complexity of the groin anatomy, the numerous clinical entities presenting with similar symptoms, the concurrence of those entities and the confusing terminology. Thus, a dilemma in diagnosis may arise leading to long-standing symptoms, disabling groin pain, mismanagement and therefore to poor treatment. Hereby, we present such a case of a recreational athlete complaining for excruciate pubic pain after being misdiagnosed and subsequently mistreated affecting her quality of life. We report on a new interesting finding, the focal osteopenia over the pubic parasymphyseal bone, together with administration of bisphosphonates for first time, as a treatment, for this condition in this body area. Our purpose is to shed light on the pathomechanism of groin pain labelled as osteitis pubis. We also outline the importance of thorough history and physical examination combined with appropriate advanced imaging.

BACKGROUND

The painful groin constitutes a great challenge. The definition of the groin is broad as it involves conditions from the lower abdomen, inguinal region, proximal adductors, hip joint, upper anterior thigh and perineum.¹ The similarity of symptoms, the coexistence of those conditions, the complexity of the groin anatomy and the confusing terminology may lead to numerous differential diagnoses and consequently to delays, mismanagement and poor treatment.¹⁻⁵

When the groin pain becomes long-standing and is localised over the symphyseal and parasymphyseal structures is labelled as osteitis pubis which is very much an umbrella term. Osteitis pubis is a painful, inflammatory and non-infectious process.⁶ It is considered as a pubic bone stress injury secondary to pregnancy and parturition, suprapubic urological and gynaecological or pelvic surgery, rheumatic disorders or athletic activity.⁶⁻⁸ In athletes, high-stress forces during sprinting, kicking, twisting and cutting can cause stress reactions and changes in the normal architecture of the pubic symphysis but the exact pathomechanism is as yet unclear.^{7 9 10}

The purpose of this article is to present a case of pubic-related pain, not described previously, caused by localised osteopenia over pubic parasymphyseal bone region and to report complete and prompt

resolution of the symptoms after administration of bisphosphonates. It illustrates a new perspective and sheds light on the pathomechanism of the so-called osteitis pubis. It also highlights the importance of thorough history and physical examination combined with advanced imaging in order to correct diagnosis and avoid unnecessary surgical interventions.

CASE PRESENTATION

Case report

A 52-year-old Caucasian woman was presented with a 9-week history of excruciate left groin pain. The onset was sudden after she had been playing intense tennis while on holiday. She was experiencing sharp, stabbing pain at the pubic symphysis during daily activities such as sitting, standing, walking short distances or lying in bed.

A gynaecological assessment identified as a cause of her pain an ovarian cyst and consequently the patient underwent a laparoscopic surgical excision of the left ovary, which had no effect on her symptoms. Administration of high amounts of analgesics and physiotherapy had been largely ineffective. The patient was admitted twice in the hospital for acute flared up of her symptoms. An injection with corticosteroid around the previous caesarean scar, as the most likely diagnosis was nerve entrapment in groin, provided some temporary relief. MRI of the pelvis was reported as normal and an ultrasound-guided block of the genitofemoral nerve was inefficient and a second ultrasound-guided corticosteroid injection around the adductor area and lateral to her labia gave her temporary relief.

The patient was displaying fear, avoidance and catastrophic reaction and was recommended psychological /psychiatric support, multimodal analgesia (including strong opioids) and physiotherapy/osteopathy.

Her pain became constant, intolerable and developed anorexia and loss of weight.

The patient was referred to our clinic. She was fearful, agitated and her quality of life was deteriorating rapidly. On clinical examination during palpation, pain was elicited over the adductor longus enthesis, pectineus and over the left superior pubic ramus. Resisted adduction with hips in extension (squeezing test) was painful while strength testing of the adductors was not feasible. There was no pain during coughing or sneezing. On a visual

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Figure 1 A dual energy X-ray absorptiometry scan of the body supplemented with specifically small field views of the symphyseal pubic area revealed bone mineral density values that are significantly lower than the average (≥ 1).

analogue scale (VAS, 1–10: with 10 being the worst), her pain scored up to 8/10. Any pressure over the pubic bone on examination produced ‘rebound pain’ a few hours later (9–10/10) atypical for overuse injuries. The patient was left-footed dominant.

INVESTIGATIONS

X-rays did not show any abnormalities and an MRI groin study protocol¹¹ showed only a mild oedema in the medial aspect of the left pectineus muscle. The patient underwent a pubic cleft injection with local anaesthetic and corticosteroid. At 10 days follow-up, her pain was improved in immediate postinjection period (4/10 on VAS for pain) but she continued complaining for pain and poor quality of life. A dual energy X-ray absorptiometry (DEXA scan) of the body supplemented with specifically small field views of the symphyseal pubic area revealed bone mineral density (BMD) values ranging from 0.240 to 0.370 and particularly on left pubic area between 0.274 and 0.347 (figure 1) that are significantly lower than the average (≥ 1). The values of BMD of lumbar spine and hips were normal.

TREATMENT

An infusion of a single dose of bisphosphonates (pamidronate 90 mg) was arranged. Five weeks later, the patient has shown significant improvement in terms of pain (VAS pain 2/10 and occasionally 5/10 being at worst). At 12 weeks postinfusion, the DEXA scan showed improvement of BMD on the left pubic area between 0.344 and 0.478 (range 0.344–0.615), while the latest DEXA scan at 38 weeks showed enhancement of BMD between 0.492 and 0.698 (range 0.373–0.698) (figure 2).

OUTCOME AND FOLLOW-UP

The patient was pain free in daily activities, her appetite returned and she regained some weight. Her mood and quality of life

were improved considerably; her self-esteem was increased, making overall an excellent recovery.

DISCUSSION

Groin pain is a common problem in athletic population and is most prevalent in sports involving kicking, sprinting, with rapid accelerations and decelerations and abrupt changes of direction.^{6 12} Groin acute strains/tears, muscle ruptures, fractures, genitourinary infections can easily be diagnosed and treated. However, in many cases, the pain may be diffuse, non-specific with uncharacteristic symptoms mimicking a number of conditions.¹³

Osteitis pubis is often a chronic condition, with an insidious onset and is considered as a cause of groin pain more prevalent in young athletes or individuals who have recently undergone gynaecological or urological procedures.^{10 14} In our case, the pubic pain preceded the gynaecological surgery (ovariectomy) as the patient was misdiagnosed with abdominal/pelvic pain on the grounds of an ovarian cyst. Also, the sudden, abrupt onset with no history of injury, in a middle-aged recreational athlete perplexed the diagnosis. Although the exact aetiology of osteitis pubis is unknown, it has been suggested that is a result of instability of the sacroiliac joints and pubic symphysis,¹⁵ or as a repetitive microtrauma triggered by reactive contracture/spasms from the adductors and abdominal musculature causing increased shear forces across the pubic symphysis during sporting activities.^{10 16–18}

This is especially true considering the fibrocartilagenous enthesis of the strong adductor longus muscle.^{19 20} Entheses are stress concentration sites due to hard–soft tissue interface at the site of attachment, and their role is to distribute the loads applied to them dynamically in order to execute movements. Thus excessive, abnormal forces may further add to the

Figure 2 At 38 weeks postinfusion of bisphosphonates, the dual energy X-ray absorptiometry scan showed enhancement of bone mineral density. Please note the weight gain from 52 kg to 58.3 kg.

stress concentration.¹⁹ As a result, the pubic bone responds to biomechanical forces/loading with bone modelling.^{19 21} Bone is a metabolically active tissue and constantly undergoes modelling throughout life in response to physiological influences and mechanical forces.²² We believe that this bone response might lead to imbalance of bone resorption/formation or the period of resorption might be prolonged due to repeated triggering and reacts as focal osteopenia. Our hypothesis was confirmed by the findings of the low subregional BMD of the parasymphyseal area while the rest of the skeleton was normal. Indeed, a histological analysis of bone biopsy specimens taken from the parasymphyseal pubic region of athletes diagnosed with sports-related chronic groin pain for at least 6 months localised in pubis demonstrated new woven bone formation.¹⁰ Interesting, no inflammatory cells were identified¹⁰ ruling out that osteitis pubis is an inflammatory process.⁶

Although our patient was at high risk to develop generalised osteopenia due to low dietary energy (eating disorder, anorexia and weight loss), administration of non-steroidal anti-inflammatory medications that inhibit COX2²³ and prolonged high dose of antiepileptic gabapentin, suppression of oestrogen and decrease of BMD (ovariectomy, hysterectomy in the past and chronic negative energy balance)²⁴ repeat of DEXA scan during the follow-ups showed that low BMD remained localised to the pubic region.

We believe that osteopenia may explain the pathomechanism on the grounds of the so-called osteitis pubis and the prolonged period of recovery for these patients. Administration of bisphosphonates helps to reduce the risk of microfractures in the osteopenic area and to inhibit the osteoclast activity and thus slowing the bone loss. It is a safely applicable and promising treatment, especially in regard to hasten patient's recovery, short-term of rehabilitation and patient's satisfaction.

Learning points

- Groin pain constitutes a challenge in diagnosis and treatment.
- Osteitis pubis is a painful condition with prolonged rehabilitation period and time loss from sports.
- Focal osteopenia over parasymphyseal pubic bone is the pathomechanism that leads to microtrauma known as bone stress injury.
- Administration of bisphosphonates for first time as a treatment for this condition is a safely applicable and promising treatment.
- Administration of bisphosphonates leads to quick and complete resolution of symptoms, fast recovery and high patient's satisfaction.

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