A LETTER FROM

BELGRADE, SERBIA

The Painful Symphysis Syndrome in Athletes and Treatment Possibilities

Reflection on the topic after 20 years of personal experience.

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Not To Be Forgotten

Sports-related groin pain has been in the spotlight for the last 30 years, with an increasing number of high level athletes, especially football players, being sidelined for significant periods of time.

This year is the 10th anniversary of the death of Dr Branko Nesovic (1930-2002), an orthopaedic surgeon from Belgrade, Serbia who, in 1967 came up with a surgical solution to this problem by reinforcing the inguinal wall with a modification of the Bassini hernia repair technique. Years later, after withstanding the test of time, his technique opened the door for other different surgical modifications in an attempt to decrease postoperative recovery time.

It is worth mentioning that Nesovic was a football player himself before becoming a doctor, playing for Red Star Belgrade. He worked in the Banjica Orthopaedic Hospital in Belgrade but remained connected to football throughout his career as the Red Star team physician.

The following is one of the rare papers on his understanding of sports related groin pain pathogenesis and a description of his surgical technique, originally published in Serbian for a sports magazine.

We provide this translation in English to inform our English-speaking doctors of this interesting and important doctor who is not necessarily recognised in the literature but who made valuable contributions to the specialty as a pioneer in athletes' groin pain surgery.

"The symphysis syndrome, groin pain, pubalgia, or any one of many polypragmatic terms for describing this pathology, has had such an increase in frequency in the last two decades that we can take the liberty to consider it a serious epidemic in sports traumatology. There are a significant number of talented athletes, who have had difficulties in achieving their athletic potential due to this painful syndrome, or who have had to stop their careers early. This painful entity affects athletes participating in different sports, particularly football players. This phenomenon has attracted huge interest between many sports medicine doctors, coaches and athletes themselves.

Dysfunction of the femoro-inguinal region with resulting groin pain was first noticed in sport 50 years ago (Spinelli 1932), but became more frequent in the last 30 years. Painful groin syndrome was first recognised in football players and was later also found in other athletes. This condition was therefore named 'footballer's groin'. The incidence increased particularly after the introduction of intensive daily training sessions and the playing of a huge number of matches during a season without the possibility for full recovery after sport activity.

Groin pain syndrome has, over time, become more embarrassing for treating physicians who face the difficult task of scientifically explaining its aetiology and searching for the most effective method that could help their athletes' to full recovery. Multiple treatment modalities for this entity were proposed.

In the past, a variety of conservative and surgical methods requiring several months of treatment unfortunately did not fulfil expectations. There was high percentage of recurrence after return to play, which was very unpleasant for the athletes and also treating physicians. Facing the painful symphysis, most sports physicians found themselves in an undesirable situation due to the inability to appropriately treat this pathology with familiar treatment options.

Affected athletes considered ending their sports career. All of that led to an inevitable conflict between athlete, physician, coaches, managers, staff, fans and media.

I would like to share my significant experience in the surgical treatment of painful symphysis syndrome in football players over the past 20 years. Accepting current views on the aetiopathogenesis of this condition in athletes and the variety of modalities for treating symphysis syndrome (according to subjective belief and clinical findings) and using a biomechanical approach, in 1967 I tried for the first time, to resolve this painful phenomenon with surgery utilising a modified Bassini technique.

I presented our first results on 14 football players surgically treated by our operative technique with very good clinical outcome on the 18th World Congress of Sports Medicine in Oxford 1970.

At a medical symposium organised by the French Football Federation in Sochaux, Colmar and Besancon, France in the early 1980s I presented my operative technique and clinical results, which were accepted by most of my colleagues. In 1981 I had an opportunity to demonstrate my surgical technique in Barcelona, Strasbourg, Rotterdam, Lille, etc.

There was an interesting presentation at the Sports Congress in Barcelona in 1981 by Dr L. Quilles, former doctor of Real Madrid. He describes his experience with surgical treatment of painful symphysis by modified Bassini technique proposed by Nesovic: "The goal of intervention is to restore the balance in such a way that is opposite to previously; instead of decreasing the adductor tensile force we should increase the abdominal wall strength. The logical theory of life is that it is more justified to enrich the poor, than to impoverish the rich. Strengthening the abdominal wall by surgery leads to effective unloading of pubic insertions which is the goal of treatment in painful pubic symphysis."

Lastly, this operative technique that we began in 1967 in Belgrade has been widely accepted in Europe and performed by a numbers of surgeons.

AETIOLOGY AND PATHOGENESIS

Painful symphysis syndrome in athletes is a painful condition of the abdomino-inguino-femoral region. It is an overuse injury, particularly prevalent in football players of different age groups and competitive levels. It arises from an important muscle imbalance at the level of pubic symphysis and disequilibrium between the anterior abdominal wall and the hypertrophic lower limbs muscles.

While appreciating other theoretical explanations of groin pain aetiology, I adopted the musculoaponeurotic theory. I believe that aetiology of painful symphysis syndrome is an imbalance between the muscle strength of two adjacent regions – the anterior abdominal wall and the lower limbs, causing an excessive functional overload of muscular and tendon insertions on the pubic bone. Musculotendineous structures and insertions of hip adductors overload, as well as rectus, obliques and transverses abdominis and the inguinal ligament, leads to damage of sub-chondral vascularisation. Over time this leads to aseptic necrosis of the pubic bone. Inflammation and metaplastic changes of tendon insertions consequently leads to local intense pain at the pubic symphysis. At that stage osteoporosis of pubic bones is often seen on X-ray.

Significant imbalance between weak muscular-aponeurotic forces and 'soft groin' (as opposed to powerful and hypertrophic lower limb muscle) and a huge overload that transits the inguinal region during exercise has led us to look for a solution with surgery. This increases the strength of aponeurosis and anterior abdominal wall muscles as well as their insertion at the symphysis. Once we establish balance of these adjacent regions by surgery, we achieve unloading of insertions and resolution of painful symptoms in the symphysis region.

While insisting on a programme of abdominal muscles strengthening as groin pathology prevention, we support the musculo-aponeurotic theory of painful symphysis syndrome.

Many European colleagues adopted my musculo-aponeurotic theory on painful symphysis syndrome and subsequent surgical technique and began to present encouraging results at medical congresses.

SIGNS, SYMPTOMS, AND DIAGNOSTIC CRITERIA

Symphysis syndrome is characterised by pain that usually starts following intense training sessions and for playing a significant number of matches over a short period of time. It has been noted in the majority of affected players that they had played three to four matches per week, without enough recovery time in between matches. Over time pain increases progressively and spreads towards the adductors, pubic bones, anterior abdominal wall, perineum and hips. After an intense training session or match, the athlete has difficulty walking, particularly climbing stairs. While walking, athletes have an antalgic gait with trunk flexed forward. In bed they usually lie on the side, with hips and knees flexed, with disturbed sleep. Getting out of bed is very painful. Standing up from a sitting position is difficult, and commencement of walking is painful. Of note, if affected players cool down during half time, they are unable to continue and request substitution. Furthermore, sneezing, coughing, defecation and even urinating are sometimes accompanied by pain in the symphyseal region. A large number of affected players have also told us that in the acute phase they had pain during sexual intercourse and were forced to avoid sexual activity. Pain that was initially bearable would increase progressively over time and lead to functional and sporting impotence.

Coaches and physicians usually expressed disbelief to athletes complaining of groin pain that spread in different directions. Staff members, physiotherapists and even physicians used to label these athletes as

"simulants, sporting deserters, cowards, conflicting personalities" etc.

Pain of differing intensity is present on palpation of adductors, rectus abdominis and inguinal ligament insertions, as well as the pubic symphysis. In chronic cases it is possible to detect the so-called "soft groin" (Prof. S. Radojevic, MD), and to feel irregularities of the anterior side of pubic symphysis. During abdominal wall contraction in a standing or supine position, it is possible to see a capital sign of weakness of oblique and transverse abdominal wall muscles and its aponeurosis – Malgaigne sign, which is a fusiform sagging from the pubis to anterior superior iliac spine. This highlights the necessity of a biomechanical approach for discovering the aetiological factors behind this painful syndrome. Through digital examination of the inguinal rings we found that they are usually wide and painful and due to severe pain in the acute stage the patient finds this extremely uncomfortable, with sometimes enlarged and painful regional lymph nodes.

Active elevation of the leg in external rotation with the knee in full extension is very painful and is usually not possible. Hip abduction is limited due to adductor pain induced by stretching. Attempting to sit up from supine position is painful at the rectus abdominis insertion, as well as trunk flexion with minimal resistance, and trunk extension.

RADIOGRAPHY

During the past decade, radiological findings in symphysis syndrome have been of interest to sport radiologists. Marked radiographic changes are easy to detect in the fully developed stage, but they are very subtle in the initial stage. They therefore present a challenge even for experienced radiologists. As the disease progresses the evolution of signs is clear, easy to detect and matching the symptoms and physical findings.

Radiographic evolution of bone changes:

- Bone proliferation on one or both pubic bones.
- Erosion on the edges of pubic bones.
- Symphyseal diasthasis.
- Symphyseal asymmetry, pubic ridge hypertrophy.
- Separated boney parts resembling loose bodies.
- Zones of demineralisation and condensation.

Radiographic cliché is similar to what is seen in avascular bone necrosis in different stages of this pathological condition.

Differential diagnosis of X-rays includes: osteitis, osteomyelitis, osteoma, osteochondroma, bone cancer, tuberculosis, sarcoidosis, hemochromatosis, rheumatic disease, traumatic symphyseal injury or the symphysis of multiparpous woman.

HISTOLOGICAL ANALYSIS

Biopsy from affected pubic bone shows bone and chondral tissue with fragments of aseptic type necrosis. Focal areas of sclerotic bone condensation have been found. Soft tissue biopsy shows connective tissue with marked perivascular infiltration of histiocytes and blood vessels hyperplasia. Significant signs of interstitial oedema are also found. These histological findings confirm chronic inflammatory changes in this painful syndrome.

TREATMENT OF PAINFUL SYMPHYSIS SYNDROME

Treatment of this painful syndrome can be either conservative or surgical. I would like to remind you of different conservative modalities utilised in the past and unfortunately still present.

CONSERVATIVE TREATMENT MODALITIES

1. Complete or relative rest for 3 to 12 months.
2. Analgesic and anti-inflammatory medications.
3. Infiltration of analgesics to the painful area.
4. Infiltration of corticosteroids.
5. Electro-analgesic procedures.
6. Ultrasound treatment.
7. Hydrotherapy.
8. Kinesiotherapy.
9. Coxofemoral cast immobilisation.
10. Orthostatic correction with insoles.
11. Radiation therapy

All these procedures can be used either solo or in combination, according to the preference of the treating doctor. Recurrence of pain will often occur and surgical treatment will be necessary.

SURGICAL TREATMENT FOR GROIN PAIN

Over the past 30 years, this painful syndrome gained more interest among sports surgeons. Many of them proposed different surgical techniques. In the beginning there was optimism which was followed by subsequent disappointment for both surgeons and athletes. To recall some techniques used in the treatment of painful symphysis: gracilis dissection, adductor longus dissection, gracilis dissection with partial pubic bone resection, rectus abdominisdisinsertion or dissection, hip adductors and rectus abdominis tenotomy, gracilis tenotomy, adductor longus tenotomy, hip adductors fasciectomy, total pubic-adductor resection, symphysis perforation, pubic bones revascularisation, simultaneous pubic perforation and hip adductor tenotomy, symphysis arthrodesis with bone graft, neurectomies of obturator, ilioinguinal, iliohypogastric and genitofemoral nerves, typical Bassini inguinal repair, McVay inguinal repair, attachment of the cord to the pubic bone, attachment of pyramidalis to the pubic bone, closure of the inguinal canal, or excision of calcification at hip adductor insertion. Most of these surgical techniques depended on the surgeon's preference and experience.

In 1967, while I was examining one of many football players with painful symphysis, I observed a significantly positive Malgaigne sign. Following a more biomechanical approach in order to highlight etiological factors behind the painful syndrome, I recommended surgery for him in order to reinforce the anterior abdominal wall. This approach was based on modification of classic Bassini repair for inguinal hernia. This surgical technique

(that has been used in several hundreds of athletes) was named 'Plastica tegmentis abdominis et canalis inguinalis sec Bassini cum modification Nesovic'. We modified the original technique and applied it to cases of painful symphysis syndrome in athletes. In all surgical cases we are yet to detect an inguinal hernia. In nine cases we found and resected a retrofunicular lipoma.

The main principle behind this technique is based on correction of the muscular imbalance between two adjacent regions: the abdominal wall and lower limbs, and the unloading of muscular-ligamentous insertions in the symphyseal region during intense physical loading. By strengthening the muscular and aponeurotic elements, it is possible to achieve a balance between the afore-mentioned regions. This procedure enables a strong base to all muscles which join and insert at the symphysis. Myofascial and fascio-fascial repair, strengthening and closing the inguinal ring and trigonum, creating a new passage for important structural elements (the spermatic cord), eliminating inguinal and parainguinal 'weak motor' points all lead to balancing muscular forces between abdominal and femoral regions. This, without a doubt, unloads all insertion points on the pubic bone, creates neurovascular balance, provides a certain degree of functional tranquility, and stabilises the pelvic ring. Our surgical technique accomplished the mentioned principles and provides a complete resolution of symptoms for affected athletes. Adopting this approach, many surgeons in Europe used this new technique in dealing with football players' painful symphysis with excellent outcomes.

POSTOPERATIVE REHABILITATION

We insist on mobilising the patient two or three days after surgery. After 2 weeks we recommend swimming, long walks and abdominal muscle-strengthening exercises. By the end of the third week we recommend easy jogging and self monitored loading, with pain being the limiting factor. By the fifth week we allow football players to start ball play, and in the sixth postoperative week they can participate in team play during training. Based on our experience, surgical patients commenced competitive play between the sixth and eights postoperative weeks.

It is important to state that athletes operated on using this method did not have recurrence and that the results achieved can be considered a complete success in the treatment of painful syndrome in the symphyseal region.

RESULTS IN THE TREATMENT OF THE PAINFUL SYNDROME

Between 1967 and 1987 I have operated on 671 football players for chronic symphysis syndrome, in all cases using the same operative technique 'Plastica tegmentis abdominis et canalis inguinalis sec Bassini cum modification Nesovic'. Of these cases, 253 cases were unilateral and 398 cases were bilateral procedures. We had no major complications and most players returned to training after 6 to 8 weeks. I performed this operation on 57 football players in their home country (France, Belgium, Spain, Germany etc) with a local surgeon, demonstrating my technique to them. Among operated athletes there has been no recurrence. It is interesting to note that I performed the same technique on two female handball players with satisfactory results.

PREVENTION OF PAINFUL PUBIC SYMPHYSIS SYNDROME

Based on our experience we advise coaches to give more attention to an exercise programme for strengthening the anterior abdominal wall, especially oblique and transverse muscles. It is very important to perform these exercises daily and systematically in football players, especially youth and junior age group players.

Treatment for this painful syndrome can be conservative or surgical. All these procedures can be solo treatment options; however, they are utilised simultaneously in different combinations from case to case, and according to the physicians' opinion. Recurrence would occur, and surgical treatment would usually be necessary.

CONCLUSION

The painful symphysis syndrome is especially significant for football players. The etiology in the development of groin pain is conflict between the unequal muscle forces of adjacent regions: anterior abdominal wall and lower limbs and unequal loading between all insertions in the symphyseal region. From our presentation of treatment modalities one can understand how many and how significant dilemmas were created in the past and many of them are still present in the treatment of this syndrome today. It has been confirmed that many athletes have been successfully treated by the surgical procedure based on the Bassini procedure for the treatment of typical inguinal hernias and which has been modified and applied by the author of this text in the treatment of painful symphysis syndrome. This surgical procedure and technique has been named 'Plastica tegmentis abdominalis et canalis inguinalis sec Bassini cum modification Nesovic'. Based on our results, we can, without a doubt, recommend this technique to all surgeons as the procedure of choice for the treatment of painful symphysis syndrome in athletes."

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