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Original article

Haglund's Syndrome: endoscopic or open treatment?

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Summary. *Background and aim of the work.* With the term "Haglund›s syndrome" we define a condition characterized clinically by pain at the insertion of Achille›s tendon and, anatomopathologically, due to the presence of retrocalcaneal bursitis and at times associated with an insertional Achille›s tendinopathy. The aim of the work is to correlate the most reliable and reproducible treatment possible to the aforementioned variables of Haglund›s syndrome. *Methods.* The classic syndromic picture is characterized by pain caused by retrocalcaneal bursitis. In some cases, symptoms of insertional tendinopathy are associated with bursitis pain. In those frameworks where symptoms were mainly exacerbated by the bursitis inflammation we have used an endoscopic technique for the resection of the underlying bone deformation and the bursa. An open technique, described in the literature as bridge sutures, was used for those patients with tendinopathic problems. While a homologous PRP unit was infiltrated in patients with degenerative insertional tendinopathy. *Results.* The group of patients that participated to the study was heterogeneous in age and functional requirements therefore presenting different anatomopathological characteristics. For these reasons considerations with correct statistical meaning are not possible. Despite different post-operative programs; patients demonstrated optimal clinical and functional recovery. There were no local neurological or skin complications. *Conclusions.* Haglund›s syndrome can have different clinical and anatomopathological patterns where conservative treatment is unsuccessful surgical solutions must be adopted. The latter have shown to be reliable and reproducible with a very low rate of complications. (www.actabiomedica.it)

Key words: Haglund, Achille›s tendinopathy, bursitis, posterior endoscopy, open surgery

Introduction

Pavlov defined the concept of Syndrome in 1928, describing those pathologies that affected the insertional district of the Achille's tendon and that Haglund himself had genuinely defined achillodynia's. The anatomopathological element responsible mainly for pain in Haglund's syndrome is represented by the retrocalcaneal bursitis. The retrocalcaneal bursa occupies, together with adipose tissue, an anatomical space ventral to the Achilles tendon called the Kager triangle, whose geometric limits on the sagittal plane are bone (postero-superior portion of the calcaneus) and tendon (anteriorly Flexor Hallux Longus tendon and posteriorly the Achille's tendon). (1,2)

The inflammation of the bursa can result from a repeated conflict between the calcaneal postero-superior spur and the ventral portion of the Achille's tendon, which can occur often in ankle dorsal flexion. The patients presenting with a cavus foot where the heel is more vertical than normal are predisposes to bone-tendon contact even in normal conditions increasing the likelihood to develop this conflict. The inflammation of the bursa can also result from repeated plantar flexion movements of the foot and ankle. In this particular condition it is detected an abnormal and repeated thrust of the most distal portion of the retrocalcaneal bursa between the calcaneus and Achille's tendon insertion to the bone. Pain originating from the bursitis can in some cases have a mixed nature with the

addition of Achilles's insertional tendonopathy pain. Insertional tendinopathies can be characterized by intratendinous calcified deposits or by areas of fibrillary disarrangement which modify the so-called "enthesic organ".

Once the clinical picture is precisely defined and after the failure of conservative treatment, it is necessary to plan a surgical procedure that has the goal of eliminating the causes of pain.

Due to the peculiarity of these presentations a sole focus to the painful districts will limit a broader understanding of the problem. It will always be useful to asses the global/postural structure with a focus on the lower limb, knowing that some conditions (static or dynamic knee valgus, core problems, cavus foot, etc.) can contribute to determine the syndromic picture and affect the final result of the treatment.

The clinical presentation is mainly characterized by pain, the characteristics of which make it possible to identify its origin.

The pain elicited by retrocalcaneal bursitis may be associated with swelling, which is expressed predominantly postero-laterally. If when performing the squeeze test, which consists of stapling the preachilleum space with the first and second fingers, intense pain is triggered,it's highly likely that a bursitic inflammation is present. It is also possible to perform an xylotest in the preachilleum space. A positive outcome (i.e. it solves more than 50% of the pain); confirms with good reliability that the inflamed bursa is responsible for the clinical picture.

Occasionally the symptoms can be associated with Achille's insertional tendinopathy. In these cases from clinical inspection the area shows signs of inflammation and intense pain at tendon pressure. (3-5)

We must confirm our clinical hypothesis with instrumental investigations. The most helpful are considered X-rays in charge, ultrasound (possibly with its elastographic applications) and MRI.

Latero-lateral radiographies offers us the possibility to Identify and quantify the hypertrophy ~~or not~~ of the postero-superior portion of the calcaneus and the signs of insertional calcific tendinopathies. Today with digital radiographs it is also possible to highlight the appearance of the diaphanous of the Kager's triangle. Normally this space has a perfect diaphanous appearance and therefore does not show areas "dirtied" by bursitic inflammation. (Figure 1)

Lines can be drawn on radiographs to calculate bone exuberance (Pavlov's lines).

The ultrasound represents a very precise diagnostic and instrumental technique in analyzing the insertional structure of the tendon.

With the use of a MRI it is possible to highlight and confirm the presence of areas of retrocalcaneal bursitis, excluding other causes of posterolateral pain of the hindfoot having the possibility to quantify the tendon structure very well at the insertion level. (6,7)

The right mix of clinical and instrumental information allows to classify the different presentations of Haglund's syndromes and to choose the right surgical approach given the failure of conservative treatments. As previously stated the surgical procedures utilized to treat these presentations are mainly two. In the absence of tendinopathic component, the minimally invasive endoscopic technique proposed by Van Dijk was used. Classical instruments for arthroscopy are frequently used (arthroscope and 4.5 mm burs 30 ° optics). Only in a few cases a 3.5 burs and 70 ° optics was necessary. In the latter surgical technique the patient is positioned prone with the foot exceeding the edge of the operating bed, free to be mobilized without the use of any traction system. A pneumoischemic strap was used and

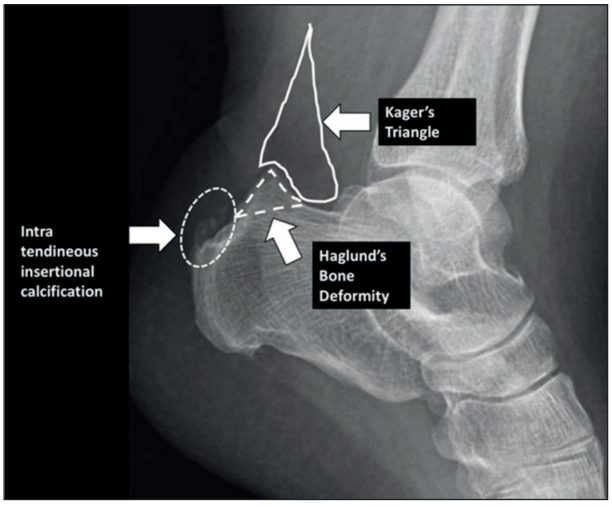

Figure 1. The X-Ray in lateral-lateral projection shows a typical picture of Haglund S. with hypertrophy of the postero-superior portion of the calcaneum, the triangle of kager not perfectly diaphanous and calcific insertional tendonopathy

para-achille's tendon posterior portals were executed (postero-medial and postero-lateral). After marking the profile of the postero-superior calcaneal tuberosity and the margins of the Achille's tendon on the skin portals were marked. During this procedure the posterior medial and posterior lateral portals are found at the same level and the incision of the skin and a careful separation of the deep tissues with a mosquito clamp can be initiated deepening towards the Kager triangle. After orienting yourself in this confined space, with the motorized removal of the adipose and bursitic tissue, the posterosuperior portion of the calcaneus was skeletonized and we were concerned with identifying the bursitic portion of the Achilles tendon. Before starting the surgery in order to be sure of being able to resect the right portion of the posterosuperior part of the calcaneus, an ampliscopic control in lateral lateral view was undertaken and a Kirshner wire inserted into the calcaneus at the right level and with the right inclination to represent the bone resection limit . During the endoscopy and with the use of an ossivorous reamer we deepen in the resection up to the visualization of the K wire. (figure 2).

The open techniques (more or less minimally invasive) described in the literature are various. Among these, the suture bridge technique was recently introduced and indicated for insertional tendinopathies allowing the approach to the pre achilleus space (to the bursa and to the often hypertrophic posterosuperior portion of the heel). This technique involves a J-like skin incision that starts at the medial parachilleus level and directs distally towards the center. Afterwards, a minimum detachment from the heel insertion and a split of the Achilles tendon are performed. After resection of the bone deformation, of the adipose and bursitic tissue and of any calcifications or degenerate tendon areas, the intervention ends with its re-insertion with various types of anchors and using various materials. The most used in the literature are soft anchors. (8-16) (Figure 3).

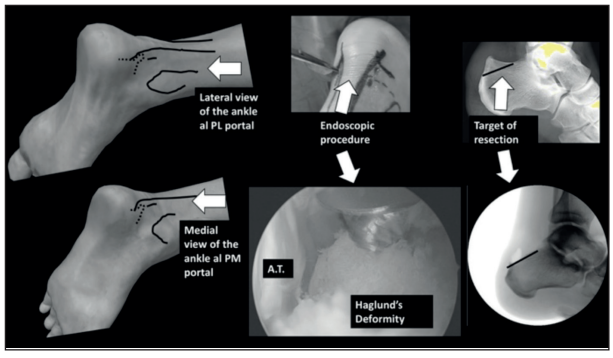

Figure 2. In the left part in evidence the para-achilleus portals, postero medial and postero lateral; in the center in evidence the operating dynamics and the use of spherical burr for the removal of the postero-superior calcaneus portion; in the right part the pre-operative determination of the heel bone to be removed and intra-operative control.

In recent years c/o the central laboratory of the AUSL of Romagna as part of the haematology/blood bank donation center, have concentrated the platelets from the donor bags to more than 300/mlx10^3. The homologous plasma with concentrated platelets, in single units of 5 ml, can be used after the activation with thrombin and calcium gluconate. Only in one case where the tendon component has been operated, especially on a degenerative basis, the Achilles tendon is infiltrated with the homologous PRP before suturing the skin.

Materials and Methods

From the operating register of the Operations Unit of Orthopedics and Traumatology of the Hospital of Forlì in the period 2004-2019, 47 patients operated for Haglund's syndrome were extrapolated, trying to form two groups as comparable as possible.

23 patients had had endoscopic surgery and 24 patients had an open technique.

Figure 3. In the left part are MRI Images in axial and sagittal view with signs of bursitis and degenerative tendinopathy. In the right part a step of the open surgery procedure and X-Ray post operative view.

Of the 23 endoscopic surgeries, 5 were women and 18 men.

Of the 24 open surgery procedures, 6 were women and 18 men.

Only in one case did we infiltrate the Achilles' reinstatement and tenorraphy site with a homologous PRP.

Pre and post operative evaluation was made with VISA-A. The VISA-A includes 10 questions that correspond to a score. The maximum score is 100 points. Subjective assessments of daily, work and sports activities are collected. (17)

To signal a progress towards well-being slightly slower for patients treated with open surgery and also a residual, but temporary, discomfort to the pressure on the Achilles tendon at its insertion. Very likely this figure reflected the different post-operative treatment followed in the two types of surgical approach.

After the endoscopy procedure the patient can immediately start a program of ankle mobilization and load within pain tolerance. For patients operated with the suture bridge technique, a period of immobilization of the ankle was respected, applying a walker with heel rise, for 25 days. During these 25 days a pain tolerant load was allowed. After 25 days of immobilization, the actual functional neuro-myo-functional recovery begins.

Results

Pre-operative VISA-A score range between 25 to 33/100 points.

In post operative evaluation the patients without Achille's tendinopathy have registred a VISA-A score of 95/100, while those with Achille's tendinopathy have registred a VISA-A score of 80/100.

All patients were satisfied with the result.

No recurrence of symptoms has been reported, no persistent skin problems for surgical incision in open surgery patients

Possible the report of reduction of sensation to the cutaneous touch to the postero-lateral region of the heel among the patients operated with open technique, with spontaneous transient character of the symptom.

It is difficult to isolate the benefit of the homologues PRP injections. In infiltrated patients who undertook an MRI 3 months post-intervention, a good T1 weighted signal of the treated tendon structure was found. Obviously, these particular data have no scientific value, but given the good clinical and instrumental results, it is preferred to carry out this infiltration even after checking the literature produced on the topic of regenerative medicine applied to tendons.

Discussion

Recently, an attempt has been made to adopt a terminology for the pathologies of the Achilles insertion district which present a peculiar clinical, anatomical- topographical and histological presentation.

In Van Dijk›s work of 2011 (18) the term Haglund›s syndrome corresponds to a painful swelling from inflammation of the retrocalcaneal bursa and, sometimes, insertional tendinopathy of the yarrow. In the absence of one of these parameters we will speak of Haglund›s exostosis (s and hypertrophy of the postero-superior portion of the heel is prevalent) or bursitis in the absence of tendinopathic aspects.

The information derived from instrumental investigations (hypertrophy of the posterior calcaneal portion, calcific deposits in the tendon at the insertional level, areas of tendon degeneration, signs of inflammation) together with clinical data allow to choose the most correct therapeutic approach.

The first approach must be conservative (heel elevations, orthosis prepare ad hoc , program with eccentric exercises, avoiding those that involve dorsal flexion, physical therapy). If conservative treatments fail, surgical treatment should be performed. The endoscopic or minimally invasive approaches adopted have already been described in their advantageous and disadvantageous aspects in the literature. Where the indications are evident, endoscopic treatment has made it possible to shorten the time of post-operative recovery and to bring into play all the advantages of the minimally invasive surgery.

Surely the endoscopic approach is considered a challenging technique were all the possible pitfalls should be acknowledged in order to avoid them. One

major risks is of not completely removing the exuberant posterosuperior bone portion, especially in its more lateral and lateral portions. The bone residue in these portions of the posterior superior tuberosity of the heel is synonymous with clinical failure due to the persistence of pain. A careful use of the motorized vehicle is paramount not to damage the Achilles tendon. Particular attention must also be paid to the level of the portals in order not to incur in a physical conflict between instruments and the patient›s calf.

Conclusions

After a correct clinical and antomo-pathological diagnosis an adeguate surgical treatment must be achieved. The reliability and reproducibility of the surgical techniques adopted allow to face the prevalent components of Haglund syndrome with a high success rate.

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