Le syndrome du piriforme : Exercice pour mieux raisonner

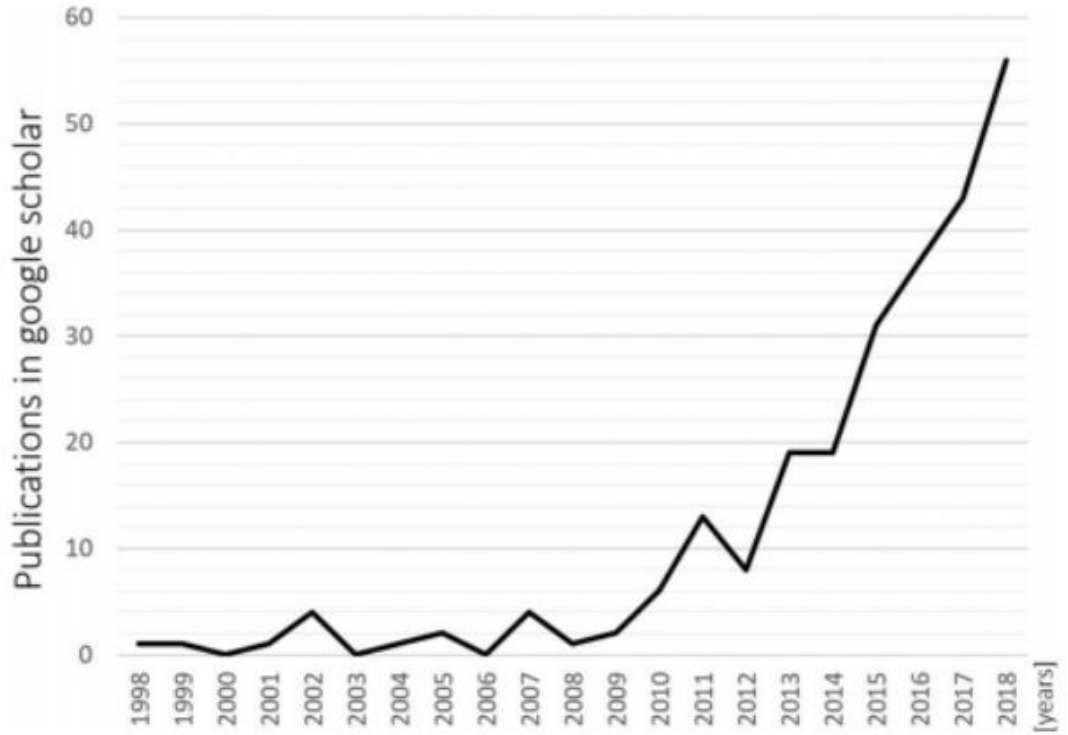
BRYAN LITTRE

Liens d'intérêts car Kiné et Formateur

BRYAN LITTRE

Le syndrome du piriforme : une entité récente

Fig. 1 The number of publications mentioning DGS in Google Scholar. More than 280 articles included the term "deep gluteal syndrome" and more than half of the articles have been published in the last 5 years



Kizaki et al. 2020

Le patient « type »

- **Douleur à la fesse pouvant irradier dans la jambe**

- **Sensibilité palpatoire,**

- **Aggravation de la douleur en position assise prolongée,**

- **Augmentation de la douleur avec des manœuvres qui « augmentent la tension du muscle piriforme ».**

HOPAYIAN, Kevork et DANIELYAN, Armine. Four symptoms define the piriformis syndrome: an updated systematic review of its clinical features. *European Journal of Orthopaedic Surgery & Traumatology*, 2018, vol. 28, no 2, p. 155-164.

Comment l'identifier

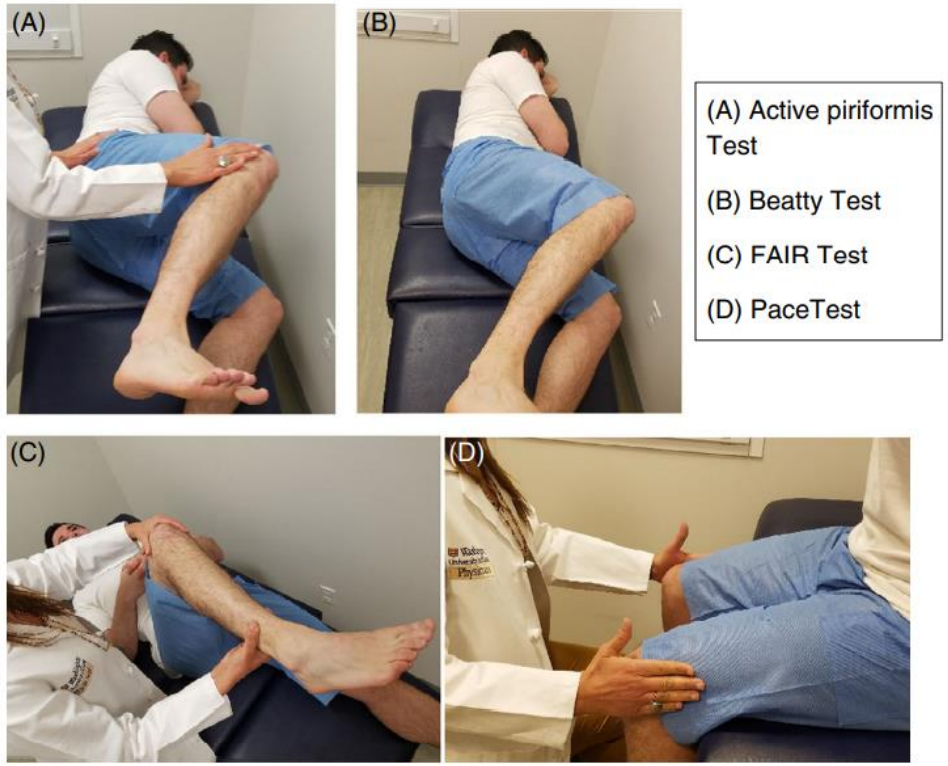


Figure 4. Physical examination special tests for piriformis syndrome. (A) Active piriformis test. (B) Beatty test. (C) FAIR test. (D) Pace test.

Fig. 7 Typical aspect of antalgic position in patients with DGS, bearing weight on the healthy ischium

+ Test Neurodynamique

Pourquoi ? La théorie des kinés

Variations anatomiques

Muscle « trop contracté »

Muscle « trop court »

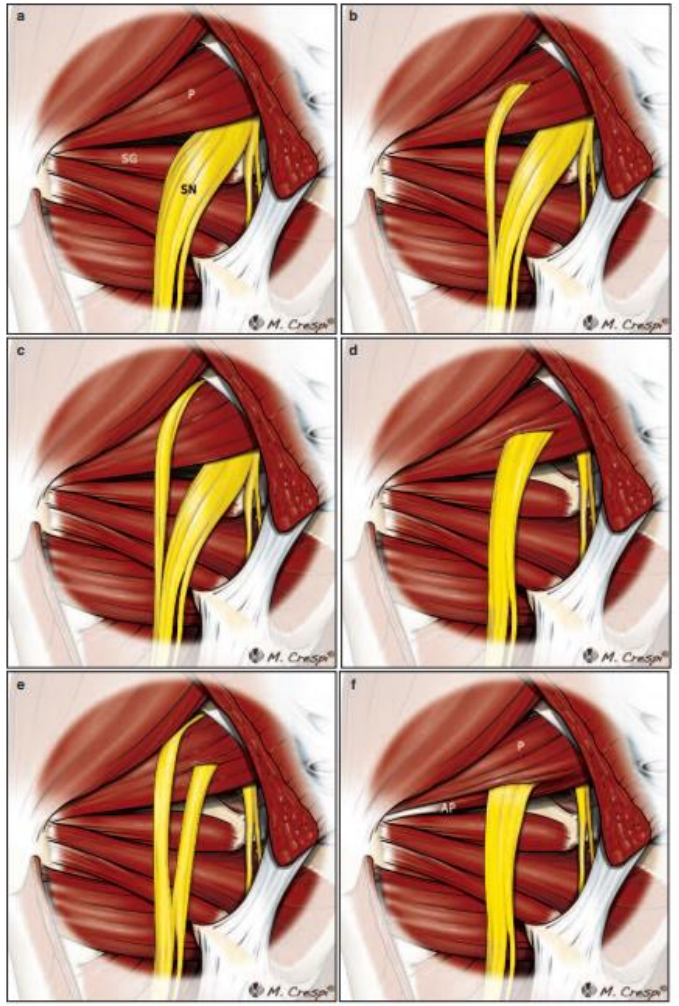


Figure 2 a-f. Anatomic variations of the relationship between the piriformis muscle and sciatic nerve. Diagrams illustrate the six variants, originally described by Beaton and Anson. (a) An undivided nerve comes out below the piriformis muscle (normal course). (b) A divided sciatic nerve passing through and below the piriformis muscle. (c) A divided nerve passing above and below an undivided muscle. (d) An undivided sciatic nerve passing through the piriformis muscle. (e) A divided nerve passing through and above the muscle heads. (f) Diagram showing an unreported additional B-type variation consisting of a smaller accessory piriformis (AP) with its own separate tendon. SN sciatic nerve, P piriformis muscle, SG superior gemellus muscle (Reprint with permission from[19]).

Variations anatomiques et Syndrome Piriforme

ORIGINAL ARTICLE

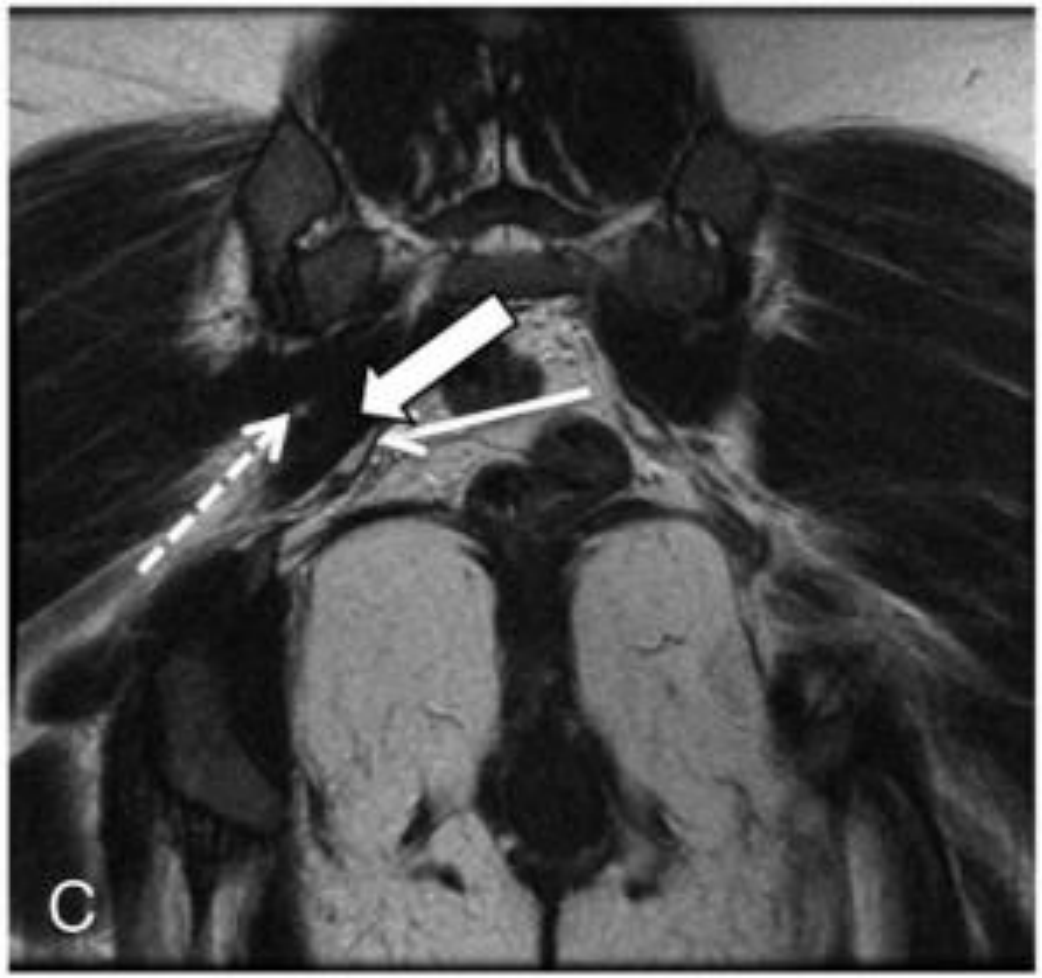
Sciatic Nerve Variants in Patients Diagnosed With Sciatica: Is There a Correlation?

Hayat Khan, MD, Stephen Ling, MD, Sayed Ali, MD, Padmaja Jonnalagadda, MD, Frederick Ramsey, PhD, Mark Weiner, MD, and Omer Awan, MD, MPH, CIIP

TABLE 1. Groups by Type of Sciatic Nerve Variation and Fisher Exact Analysis

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
Expected, %	84.15	13.85	1.30	0.53	0.08	0.08
Observed, %	55.9	41.94	2.15	0	0	0

Fisher exact test.
$Pr \leq P < 0.0001$.



Variations anatomiques et Sciatalgie

Anisotropie fractionnelle et Tenseur de diffusion

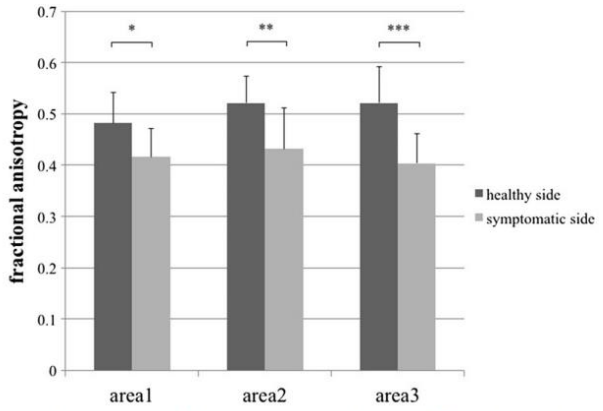


Fig. 3 Comparison of FA in patients with sciatica. *Error bars* indicate standard deviation. * $p = 0.020$, ** $p = 0.009$, *** $p = 0.001$

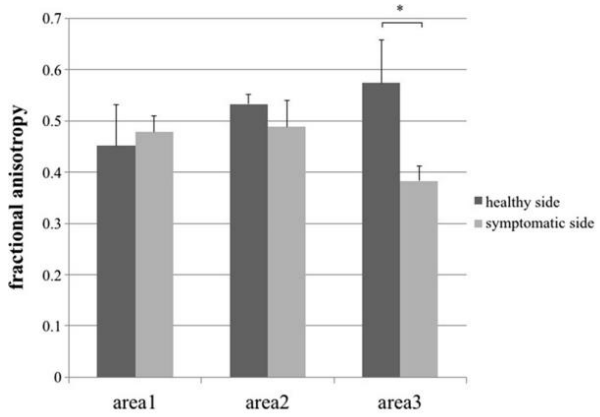


Fig. 5 Comparison of FA in patients with no findings on lumbar MRI. *Error bars* indicate standard deviation. * $p = 0.046$

On retient que :

Ce sont des indicateurs de changements de flux dans le nerf

LE BIHAN, Denis. Apparent diffusion coefficient and beyond: what diffusion MR imaging can tell us about tissue structure. *Radiology*, 2013, vol. 268, no 2, p. 318-322.

WADA, Keizo, HASHIMOTO, Takuya, MIYAGI, Ryo, *et al.* Diffusion tensor imaging and tractography of the sciatic nerve: assessment of fractional anisotropy and apparent diffusion coefficient values relative to the piriformis muscle, a preliminary study. *Skeletal radiology*, 2017, vol. 46, no 3, p. 309-314.

Vraisemblance et opération

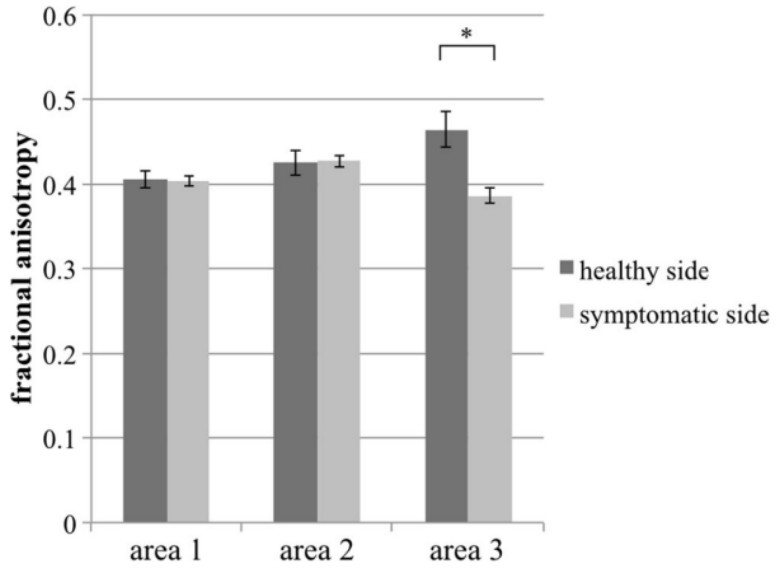
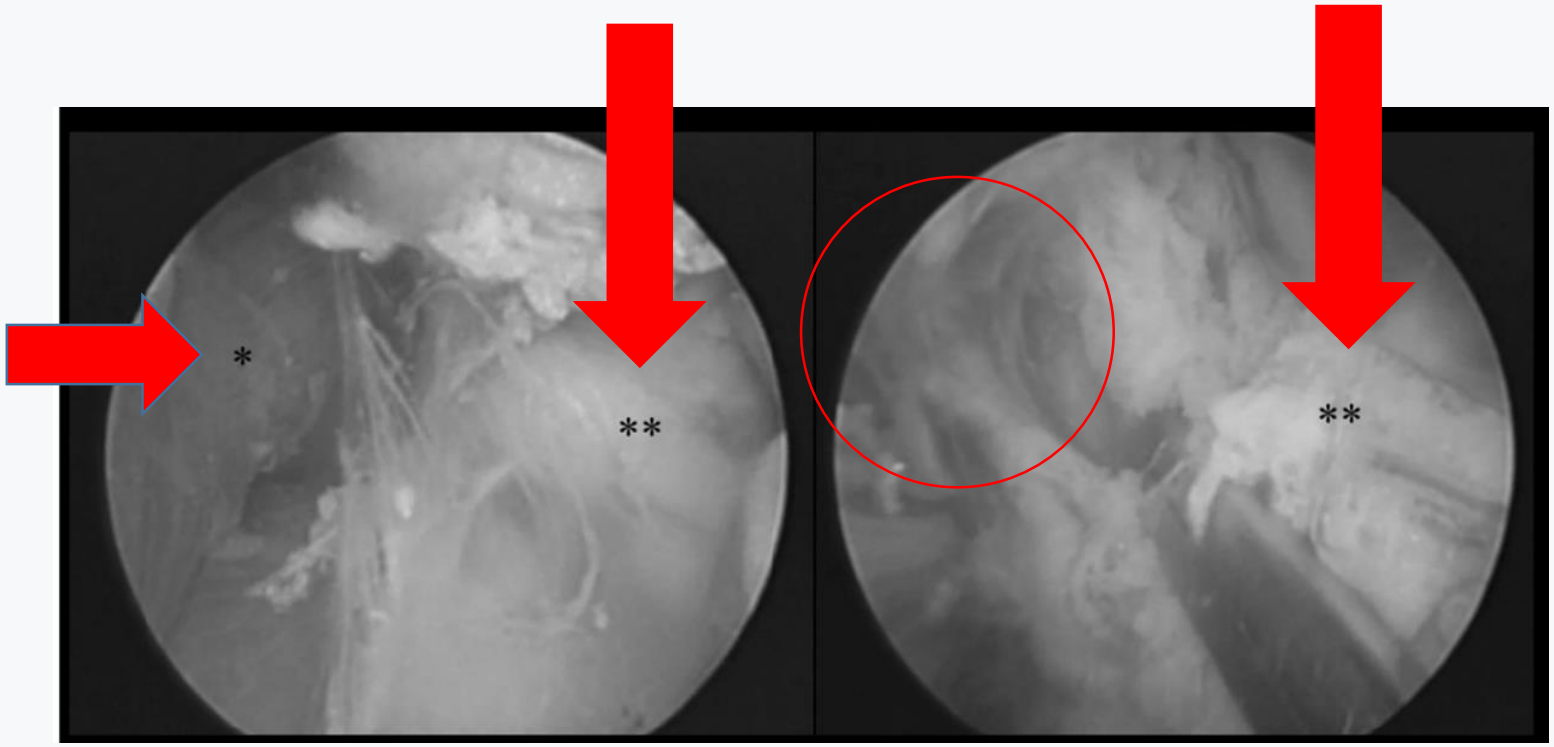


Fig. 2 Comparison of fractional anisotropy on the affected side and the unaffected side before surgery. *Error bars* indicate the standard deviation. *$p = 0.008$



VANERMEN, Frédérique et VAN MELKEBEEK, Jan. Endoscopic Treatment of Piriformis Syndrome Results in a Significant Improvement in Pain Visual Analog Scale Scores. *Arthroscopy, Sports Medicine, and Rehabilitation*, 2022.

WADA, Keizo, GOTO, Tomohiro, TAKASAGO, Tomoya, *et al.* Piriformis muscle syndrome with assessment of sciatic nerve using diffusion tensor imaging and tractography: a case report. *Skeletal Radiology*, 2017, vol. 46, no 10, p. 1399-1404.

La parcours des patients

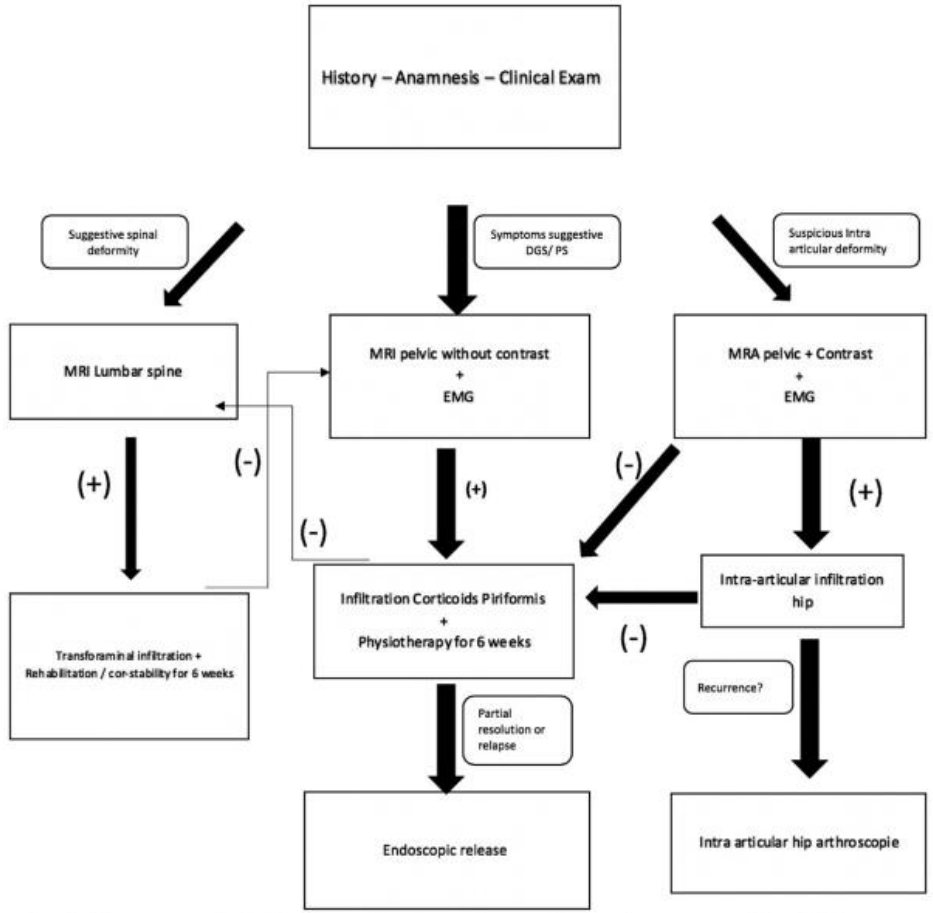


Fig 1. Diagnostic decision protocol. (DGS, deep gluteal syndrome; EMG, electromyography; MRA, magnetic resonance arthrography; MRI, magnetic resonance imaging; PS, piriformis syndrome.)

Douleur neuropathiques

Intolérance position assise

Tests cliniques

Echec traitement conservateur

Les traitements dans les années NONANTES

Muscle « trop contracté »

Muscle « trop court »

Masse, Appui, Etire

Le traitement « type » injection

Effet de la Toxine Botulique

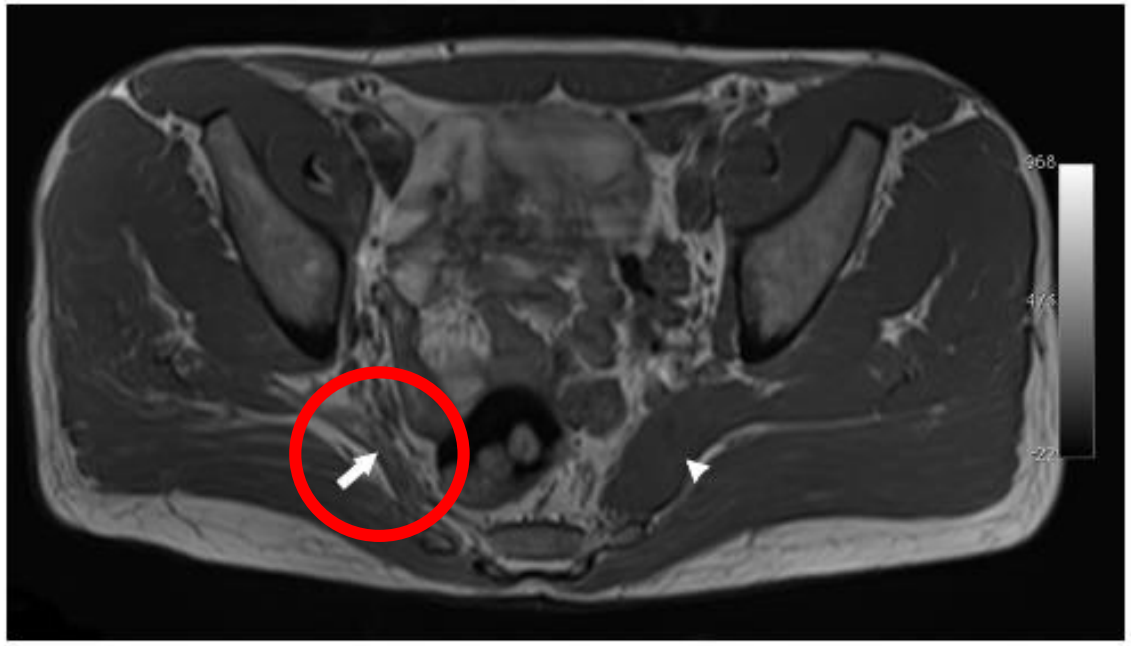


Figure 6. Grade 3 Goutallier's classification of fatty infiltration of the right piriformis muscle in a 42-year old patient treated with BT in the right piriformis muscle.

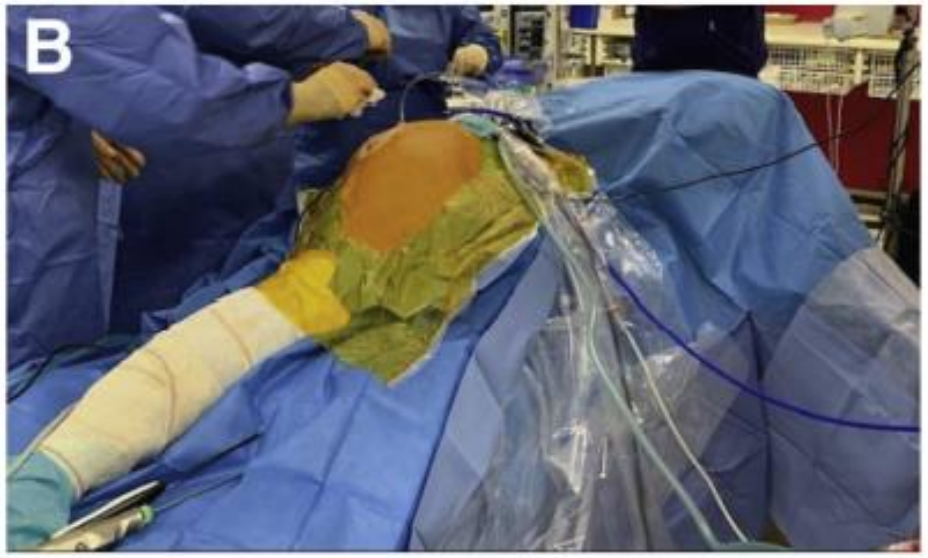
Si échec du traitement conservateur

- **Injection corticoïdes**
- **Injection anesthésiques**
- **Injection toxine Botulique**

Le traitement chirurgical

Section du tendon du piriforme +/- Neurolyse

KNUDSEN, Joshua S., MEI-DAN, Omer, et BRICK, Mathew J. Piriformis syndrome and endoscopic sciatic neurolysis. *Sports Medicine and Arthroscopy Review*, 2016, vol. 24, no 1, p. e1-e7.



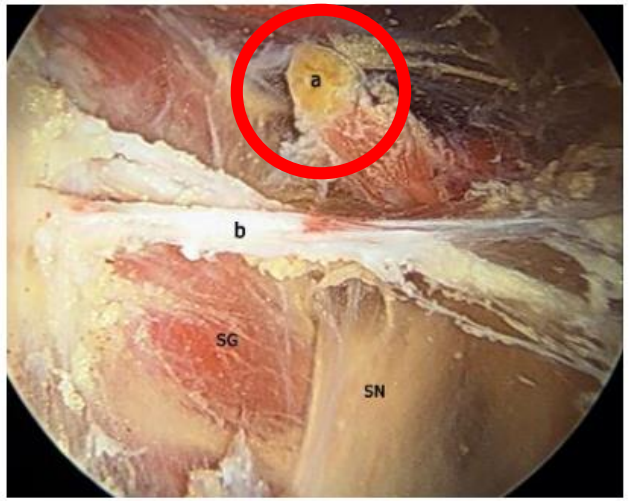


Figure 12. Left hip. Sciatic nerve at the sciatic notch. a) Piriformis tendon after release; b) fibrovascular band, SG Superior gemellus muscle, SN Sciatic nerve.


Original Article

Endoscopic Treatment of Piriformis Syndrome Results in a Significant Improvement in Pain Visual Analog Scale Scores

Frédérique Vanermen, M.D., and Jan Van Melkebeek, M.D.

AGUILERA-BOHORQUEZ, B., CARDOZO, O., BRUGIATTI, M., *et al.* Endoscopic treatment of sciatic nerve entrapment in deep gluteal syndrome: clinical results. *Revista Española de Cirugía Ortopédica y Traumatología (English Edition)*, 2018, vol. 62, no 5, p. 322-327.

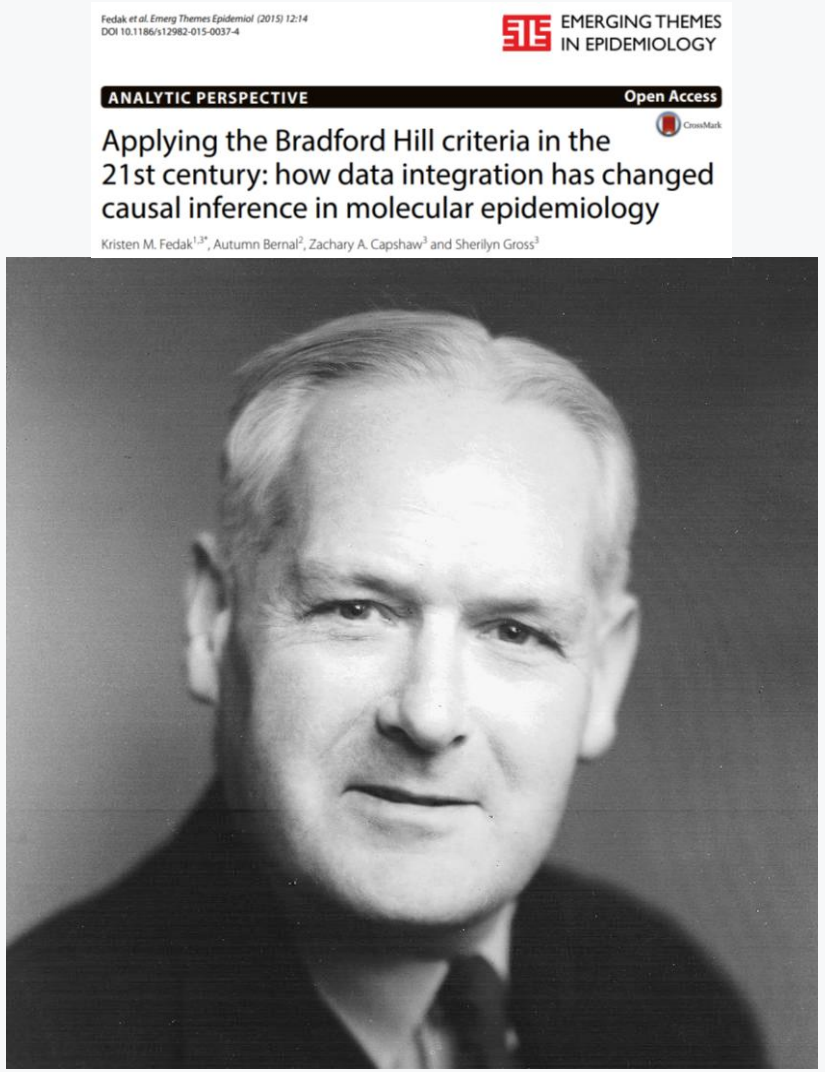

Endoscopic release of the piriformis tendon and sciatic nerve exploration

Du cou  **existe ?**

Êtes-vous sûrs d'être sûrs

Les critères de causalité de Bradford Hill 1965

- **Plausibilité biologique**
- **Cohérence biologique**
- **Présence de données expérimentales**
- **Analogie**
- **Force de l'association**
- **Relation dose-effet**
- **Temporalité d'association**
- **Spécificité de l'association**
- **Reproductibilité des résultats**



Signes propres ?

Corresponding scapular pain with the nerve root involved in cervical radiculopathy

Masaya Mizutamari [1], Akira Sei, Akinari Tokiyoshi, Toru Fujimoto, Takuya Taniwaki, Wakana Togami, Hiroshi Mizuta

Is There an Association Between Lumbosacral Radiculopathy and Painful Gluteal Trigger Points?: A Cross-sectional Study

Specificity of diagnostic nerve blocks: a prospective, randomized study of sciatica due to lumbosacral spine disease

North, Richard B.[*,a]; Kidd, David H.[a]; Zahurak, Marianna[b]; Piantadosi, Steven[b]

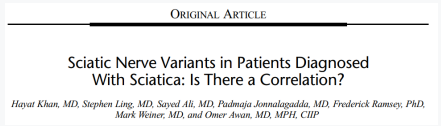
« C'est local dans la fesse »

« Je ressens un nœud à la palpation »

« les injections de toxine botulique ou corticoïdes aident »

La majorité des douleurs de la région de la fesses sont liées à des radiculopathies lombaires

Corrélation ?



ORIGINAL ARTICLE

Sciatic Nerve Variants in Patients Diagnosed With Sciatica: Is There a Correlation?

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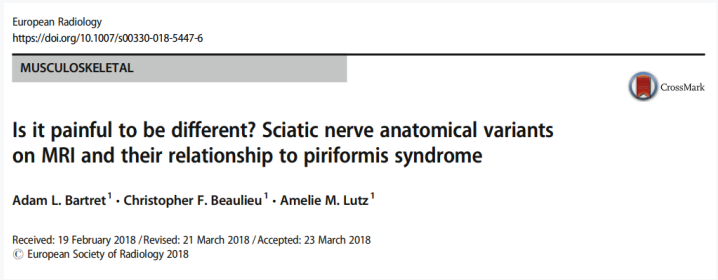

European Radiology
https://doi.org/10.1007/s00330-018-5447-6

MUSCULOSKELETAL

CrossMark

Is it painful to be different? Sciatic nerve anatomical variants on MRI and their relationship to piriformis syndrome

Adam L. Bartret[1] · Christopher F. Beaulieu[1] · Amelie M. Lutz[1]

Received: 19 February 2018 / Revised: 21 March 2018 / Accepted: 23 March 2018
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Variations anatomiques

Sur 783 patients 19,2% des personnes ont une variations anatomique

Pas d'association avec syndrome piriforme, sciatalgie, douleur dans la région fessière

Cohérence externe et plausibilité biologique

- **Syndrome canalaire**
- **Contenant-Contenu**
- **Canal <u>Ostéo-fibreux</u>**
- **Exception syndrome des loges**
- **Muscles permettent meilleure vascularisation par pompage**
- **Muscles protègent les nerfs**

Selon la littérature actuelle : plausibilité biologique proche de zéro mais vérifions

Cohérence externe et traitement kiné ?

Appuyer dessus ?

Attention à l'ischémie nerveuse et l'irritabilité et la perte de fonction

Cohérence externe et traitement kiné ?

Tirer dessus ?

Attention à l'ischémie nerveuse et l'irritabilité et la perte de fonction

Réfléchissez avant d'agir

Spine

SPINE Volume 36, Number 1, pp 57–62
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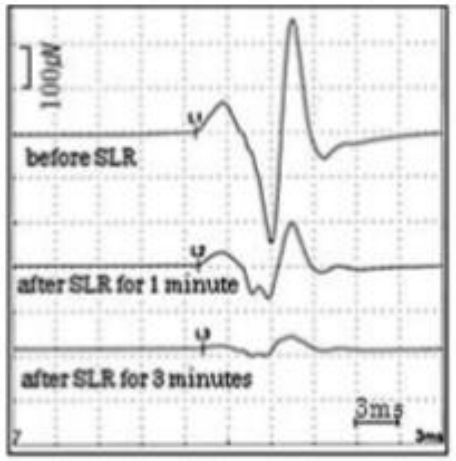
DIAGNOSTICS

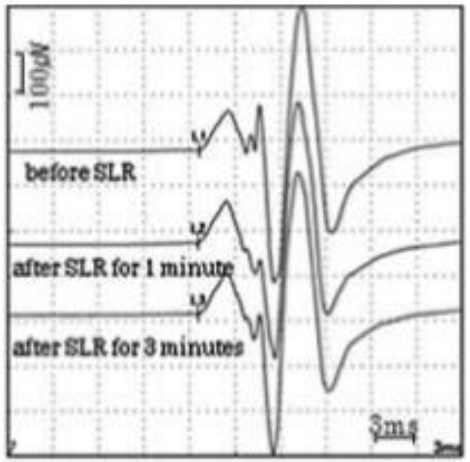
Combined Measurement of Nerve Root Blood Flow and Electrophysiological Values

Intraoperative Straight-Leg-Raising Test for Lumbar Disc Herniation

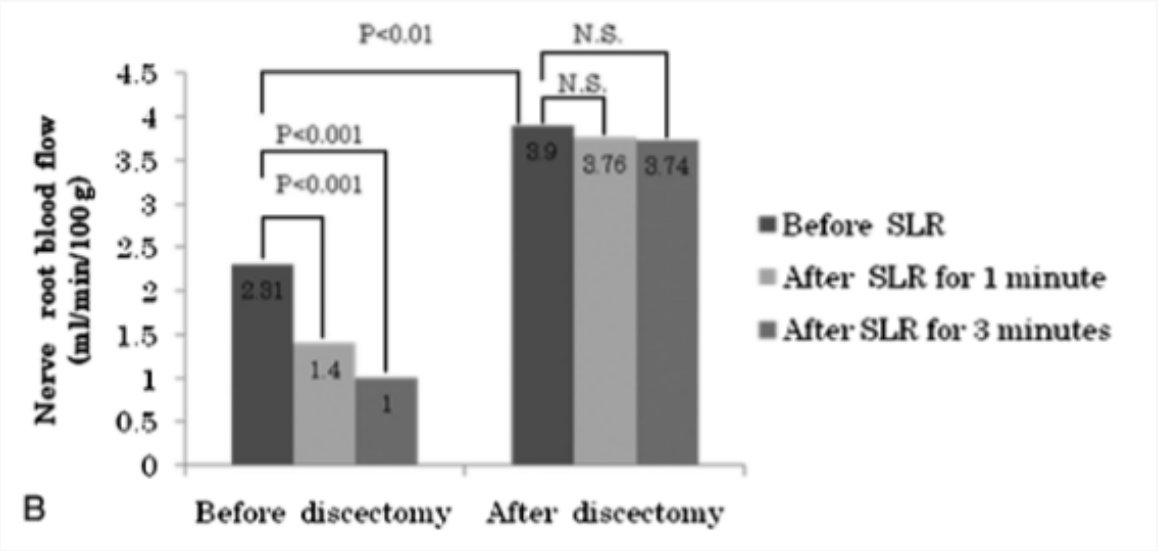
Yoshihiro Takamori, MD, Jun Arimizu, MD, PhD, Teruaki Izaki, MD, PhD, Masatoshi Naito, MD, PhD, and Tatsuki Kobayashi, MD



Before discectomy



After discectomy



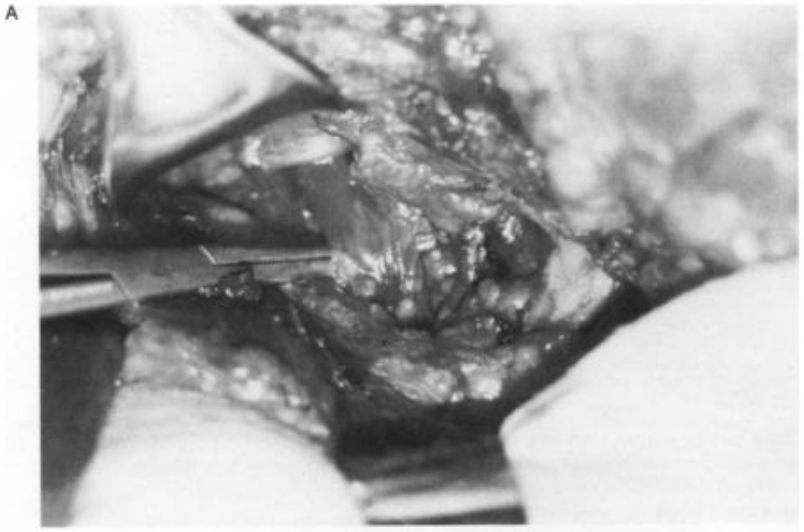
Expertise, connaissance, plausibilité

Croire qu'un muscle est assez puissant pour générer une neuropathie sur le long terme

Tous les bodybuilders auraient des neuropathies si cela aurait été le cas

Ce serait comme croire que cet individu n'est pas dopé

Plausibilité : Sayson et al 1994



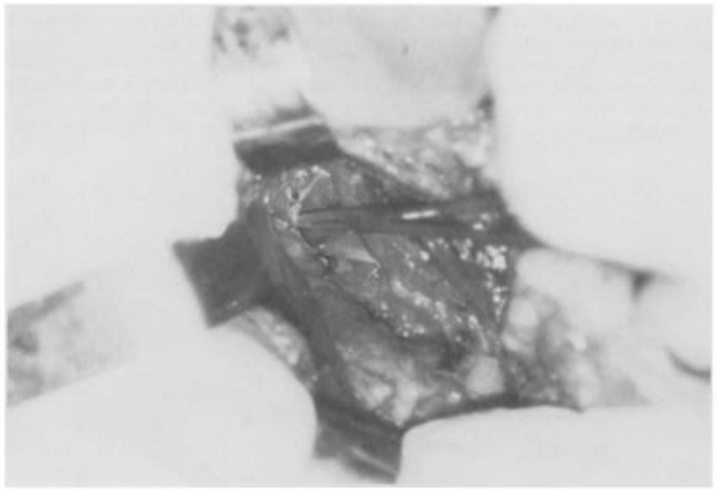


Fig. 3. Intra-operative photograph showing fascial band (shown here being elevated by forceps). Structure lying parallel and deep to forceps is the sciatic nerve.

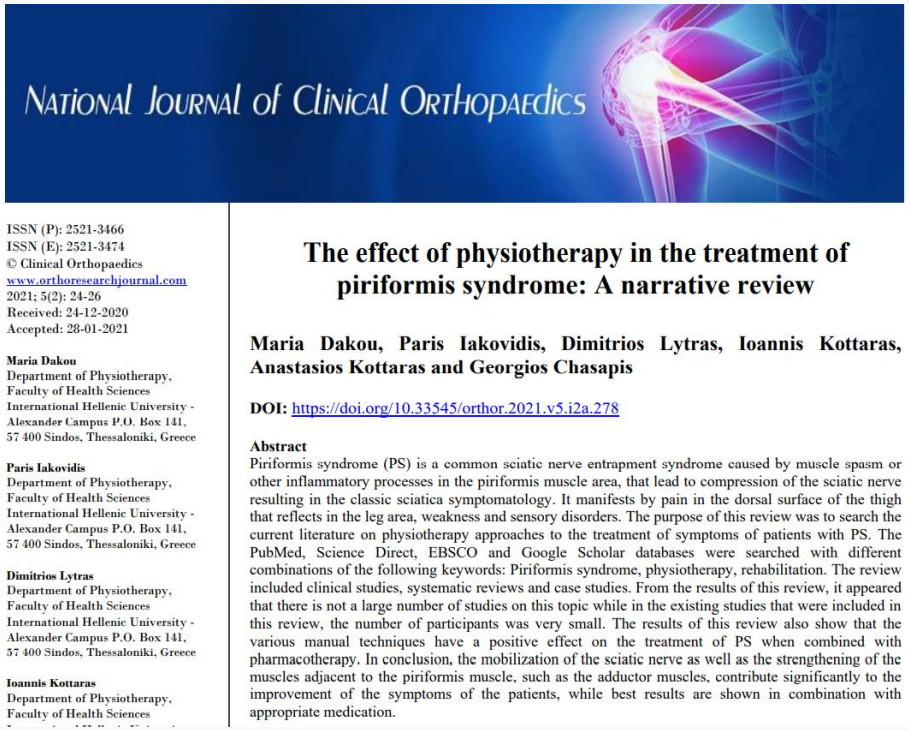
here is the

piriformis muscle being elevated by forceps; sciatic nerve can be seen in part at the retractor edge.

press the sciatic nerve. Additionally, Pecina (1979) studied the relationship between the piriformis muscle and the sciatic nerve in cadavers. He discovered that nerve compression could only be produced if the nerve was passing through the tendinous portion of a stretched piriformis muscle. A common requirement in

inferiorly where the sciatic nerve was fixed by the fascial band. Admittedly, the presence of the fascial band alone could account for the entrapment neuropathy, as described previously by Banerjee and Hall (1976). Nonetheless, the unusual anatomic findings in this patient resulted in myofascial pain and neuropathy

Plausibilité et traitement kiné ?



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The effect of physiotherapy in the treatment of piriformis syndrome: A narrative review

Maria Dakou, Paris Iakovidis, Dimitrios Lytras, Ioannis Kottaras, Anastasios Kottaras and Georgios Chasapis

DOI: https://doi.org/10.33545/orthor.2021.v5.i2a.278

Abstract
Piriformis syndrome (PS) is a common sciatic nerve entrapment syndrome caused by muscle spasm or other inflammatory processes in the piriformis muscle area, that lead to compression of the sciatic nerve resulting in the classic sciatica symptomatology. It manifests by pain in the dorsal surface of the thigh that reflects in the leg area, weakness and sensory disorders. The purpose of this review was to search the current literature on physiotherapy approaches to the treatment of symptoms of patients with PS. The PubMed, Science Direct, EBSCO and Google Scholar databases were searched with different combinations of the following keywords: Piriformis syndrome, physiotherapy, rehabilitation. The review included clinical studies, systematic reviews and case studies. From the results of this review, it appeared that there is not a large number of studies on this topic while in the existing studies that were included in this review, the number of participants was very small. The results of this review also show that the various manual techniques have a positive effect on the treatment of PS when combined with pharmacotherapy. In conclusion, the mobilization of the sciatic nerve as well as the strengthening of the muscles adjacent to the piriformis muscle, such as the adductor muscles, contribute significantly to the improvement of the symptoms of the patients, while best results are shown in combination with appropriate medication.

Tout d'abord faire un bilan de neuropathie et de névralgie

Exclure et trier

- **Exposition graduelle aux contraintes**
- **Travail de tout le bassin et du tronc**
- **Neurodynamique**

Relation Dose-Effet

Skeletal Radiol. 2021 Dec 18. doi: 10.1007/s00256-021-03970-x. Online ahead of print.

Piriformis syndrome: muscle thickness or volume does not correlate with response to CT-guided injection

Rocco Hlis [1], Kevin Yan [1], Yin Xi [1], Avneesh Chhabra [2] [3]

Affiliations + expand

PMID: 34921609 DOI: 10.1007/s00256-021-03970-x

On ne parle pas ici d'Hypertrophie VRAIE, mais plusieurs interprétations possibles

Table 3 Summary of patients in whom cross-sectional imaging diagnosis of an unknown underlying medical condition, manifested as PMs, has changed treatment planning. Final diagnosis, treatment decisions and outcome are presented

No.	Aetiology	Treatment decision	Outcome
Primary PMs			
1	PM abscess (*Staphylococcus aureus*)	Antibiotic treatment	CR
2	Fall from 2.5 m and PM haematoma	Conservative	CR
Secondary PMs			
1	Pelvic metastasis-breast carcinoma	Chemotherapy	NR
2	Pelvic histiocytic saroma	Chemotherapy	NR
3	Pelvic osseous metastasis of unknown origin-pelvic lymphadenopaty	Chemotherapy	NR
4	Pelvic haemangiopericytoma	Radiotherapy	PR
5	Pelvic metastasis of unknown origin	Radiotherapy	PR
6	Pelvic osseous metastasis of unknown origin	Radiotherapy	NR
7	Pelvic chondrosarcoma	Chemotherapy/Radiotherapy	NR
8	PM oedema from sacroiliitis due to ankylosing spndylitis	Anti-TNF	CR
9	Pelvic varicose veins	Conservative	NR
10	Pelvic varicose veins	Conservative	NR
11	Pelvic varicose veins	Conservative	NR
12	Aseptic pelvic systemic abscess-Crohn's disease	Corticosteroids	CR
13	Obturator internus bursitis	Corticosteroids injection-US guidance	CR
14	Internal iliac vein dilatation	Intravascular treatment	CR
15	Neural mesothelioma	Surgery	PR
16	Quadratus femoris tear and haematoma extending to the PM	Surgery	PR
17	Sacral chordoma	Surgery	NR
18	Sacral aneurysmal bone cyst	Surgery	PR
19	SN neurogenic tumour	Surgery	CR
20	Pelvic chondrosarcoma	Surgery	NR
21	Sacral chordoma	Surgery	NR
22	Tarlov cysts	Surgery	CR
23	Internal iliac vein dilation	Surgery	PR
24	Ovarian cystic teratoma	Surgery	CR
25	SN benign neurogenic tumour	Surgery	CR
26	Pelvic hydatid disease	Surgery	CR
27	Lipoma between gluteal muscles	Surgery	CR
28	SN neurogenic tumour	Surgery	CR
29	SN neurofibrosarcoma	Surgery	NR
30	Pelvic hibernoma	Surgery	PR
31	Presacral abscess (tuberculosis)	Surgery	PR
32	Endometrioma	Surgery	CR

PMs piriformis muscle syndrome *PM* piriformis muscle, *SN* sciatic nerve, *NR* no response, *PR* partial response, *CR* complete resolution, *US* ultrasound, *Anti-TNF* anti-tumour necrosis factor

10 ans

Prospective

184 patients pour imagerie
74 en lien avec le piriforme

Réponse au traitement

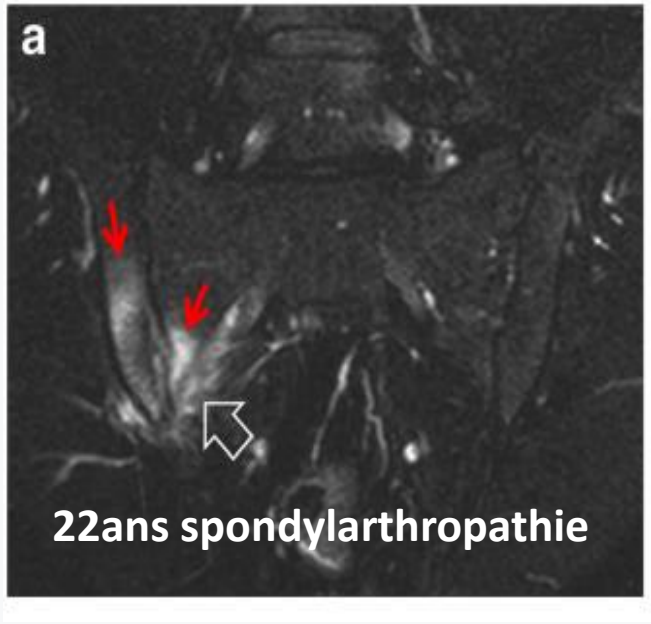
Une étude prospective

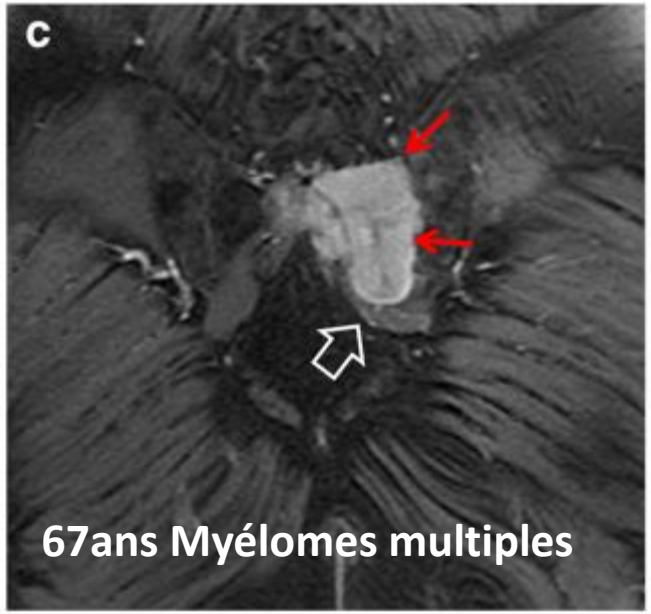
Table 1 Imaging findings and related aetiologies in patients with primary PMs

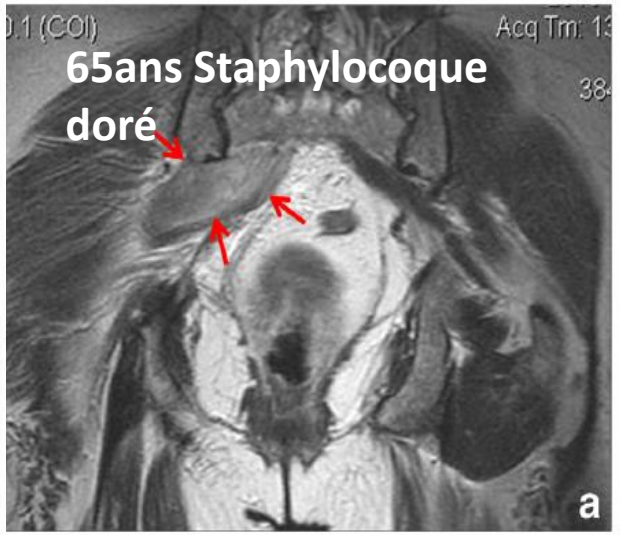
Primary PMS				
No.	Sex	Age (years)	Final diagnosis	PM enlargement
1	M	5	PM myositis ossificans (postoperative)	✓
2	M	26	PM myositis ossificants (blunt injury following drug abuse)	✓
3	M	65	Fall from 2.5 m and PM haematoma	✓
4	F	40	Massive PM infarction	✓
5	F	20	PM enlargement (leg length discrepancy)	✓
6	M	20	PM enlargement	✓
7	M	25	PM enlargement (elite football player)	✓
8	M	52	PM post-radiation myositis	✓
9	F	65	PM abscess (*Staphylococcus aureus*)	✓
10	M	67	PM atrophy/fatty infiltration-PM enthesopathy	
11	F	50	PM enlargement (contralateral amputation)	✓
12	M	66	PM enlargement (contralateral total hip replacement)	✓

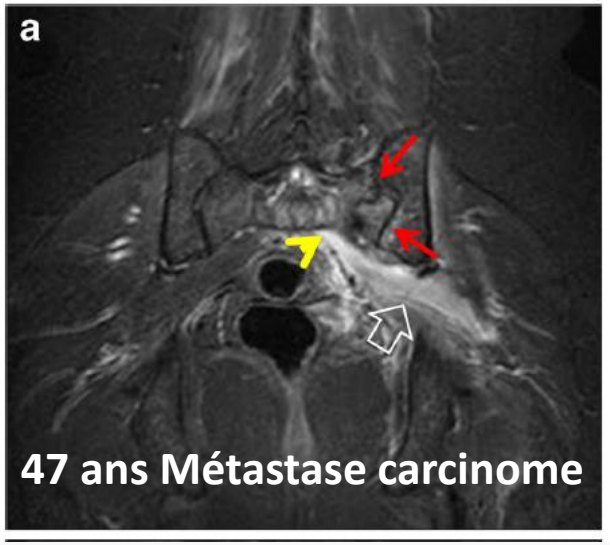
PMs piriformis muscle syndrome, *PM* piriformis muscle, *M* male, *F* female, *SI* signal intensity

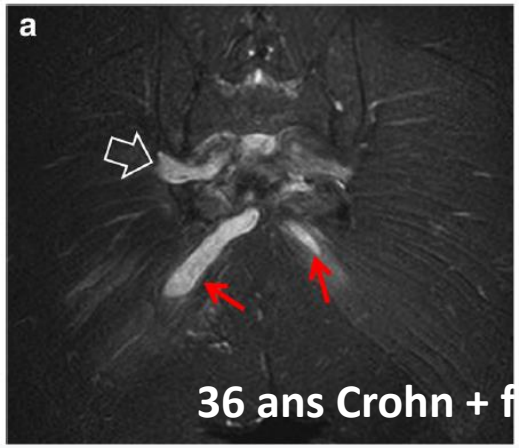
Qu'observe-t-on ?

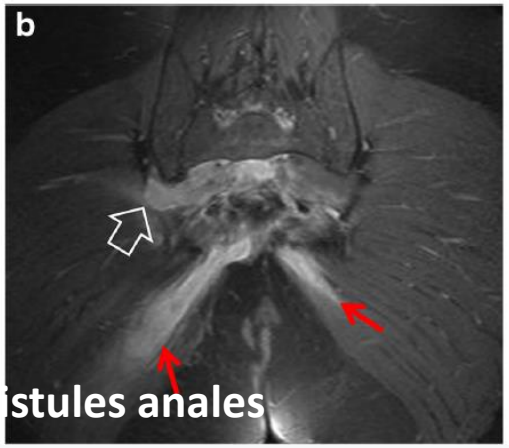


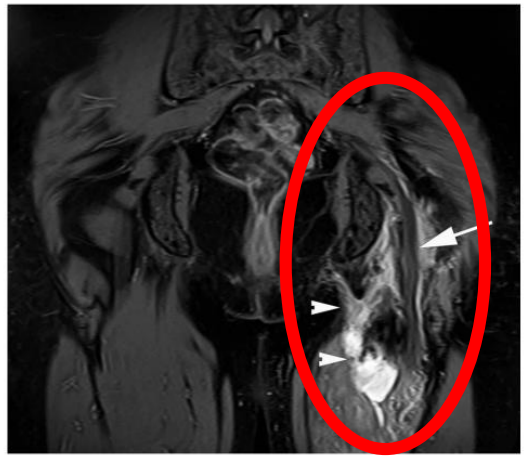













C NEWS
19:11 DIRECT
FACE A L'INFO
ANGELA MERKEL, LA CHANCELIÈRE D'ACIER
BREXIT
Angela Merkel a appelé l'UE à se préparer à un éventuel «no-deal» dans les négociations sur la future relation commerciale avec le Royaume-Uni.

Jamais un problème de piriforme ?

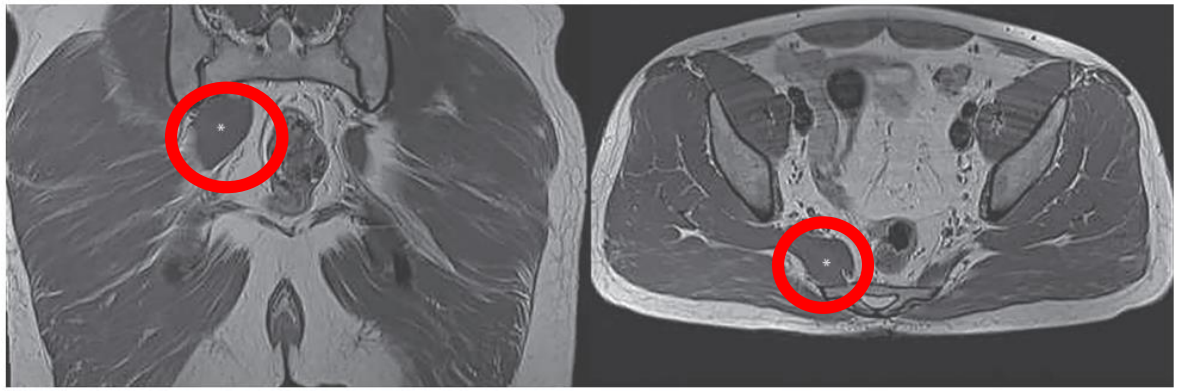


Fig. 2

Piriformis syndrome (37-year-old male). Asymmetrically large right piriformis muscle (white asterisks) was shown on T1-weighted coronal and axial images of MRI.

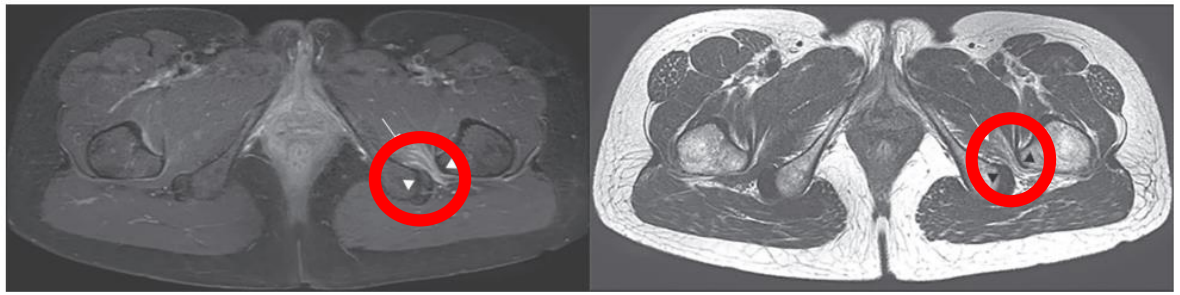


Fig. 3

Ischiofemoral impingement syndrome (46-year-old female). Increased signal intensity and contrast enhancement were noted in quadratus femoris at the left ischiofemoral interval (white arrows) on T2 and T1 weighted axial MRI images. White and black triangles indicate the ischium and lesser trochanter.

PARK, Jung Wee, LEE, Young-Kyun, LEE, Yun Jong, *et al.* Deep gluteal syndrome as a cause of posterior hip pain and sciatica-like pain. *The Bone & Joint Journal*, 2020, vol. 102, no 5, p. 556-567.

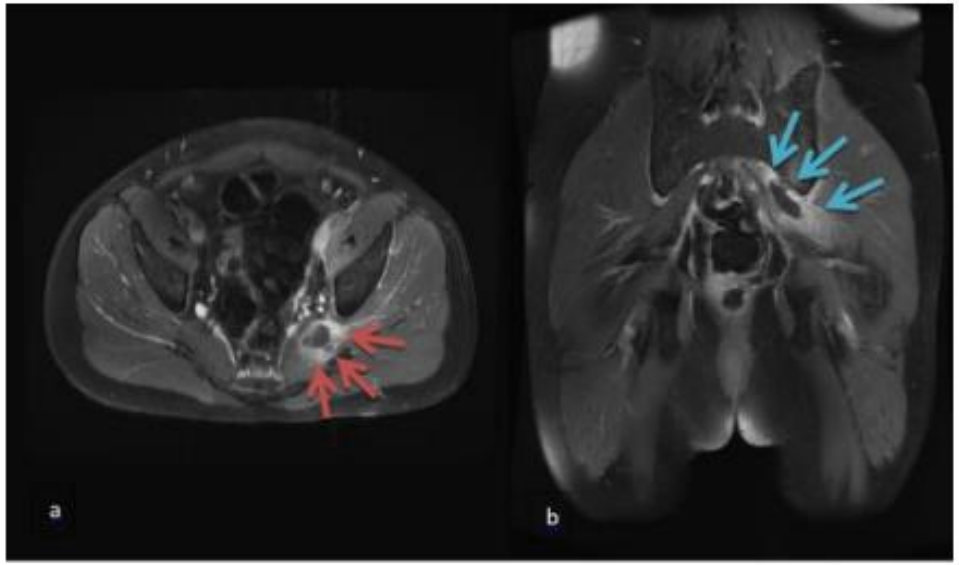
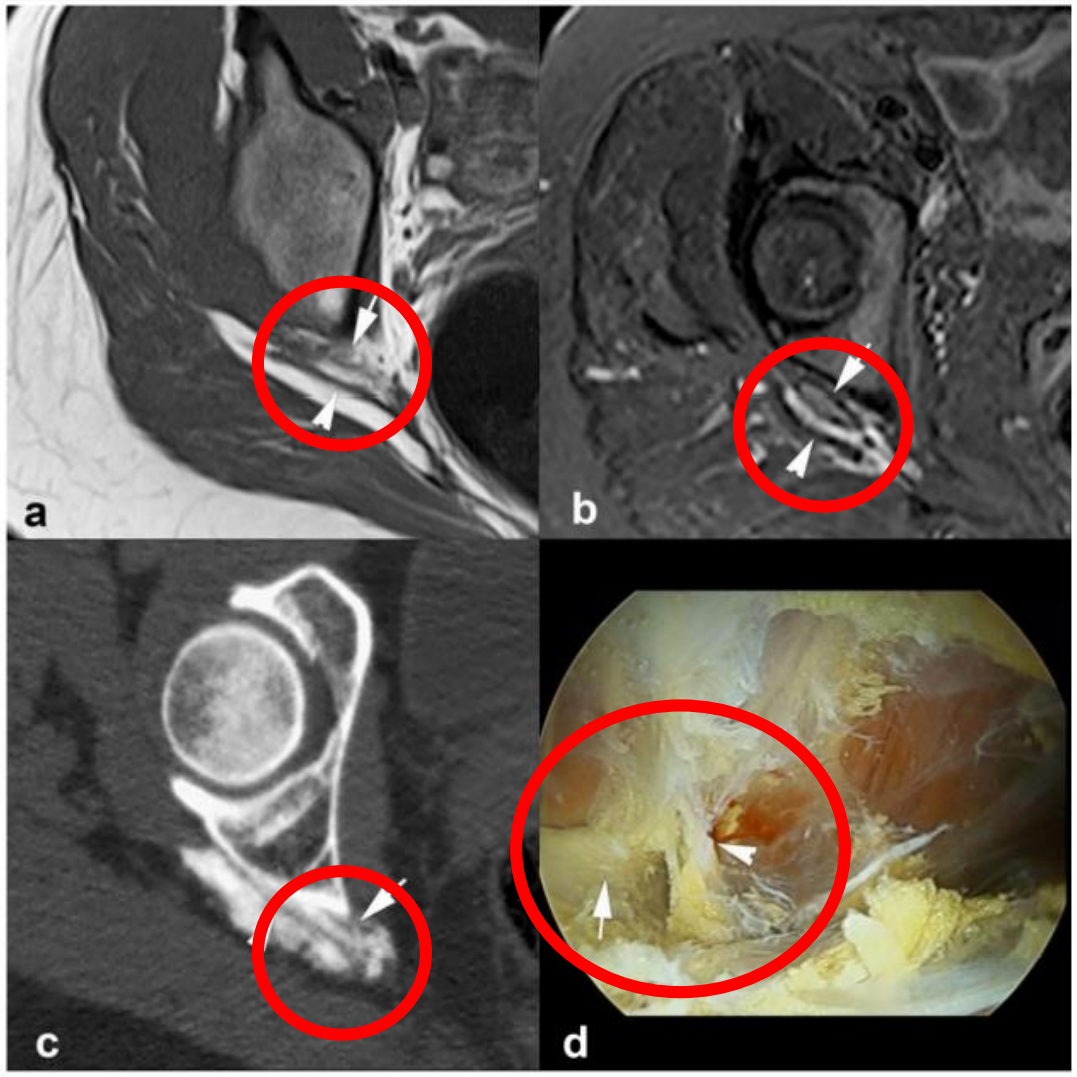


Fig. 1. Contrast-enhanced T1 fat-saturated axial (a, red arrows) and coronal (b, blue arrows) pelvic MRI, illustrating an abscess in left Piriformis muscle; (a) Post contrast axial image, (b) Post contrast coronal image

SALEHI, Mohammadreza, GHIASVAND, Fereshteh, FEIZABADI, Mohammad Mehdi, *et al.* The piriformis abscess: a case-based review. *Iranian Journal of Microbiology*, 2021, vol. 13, no 2, p. 252.

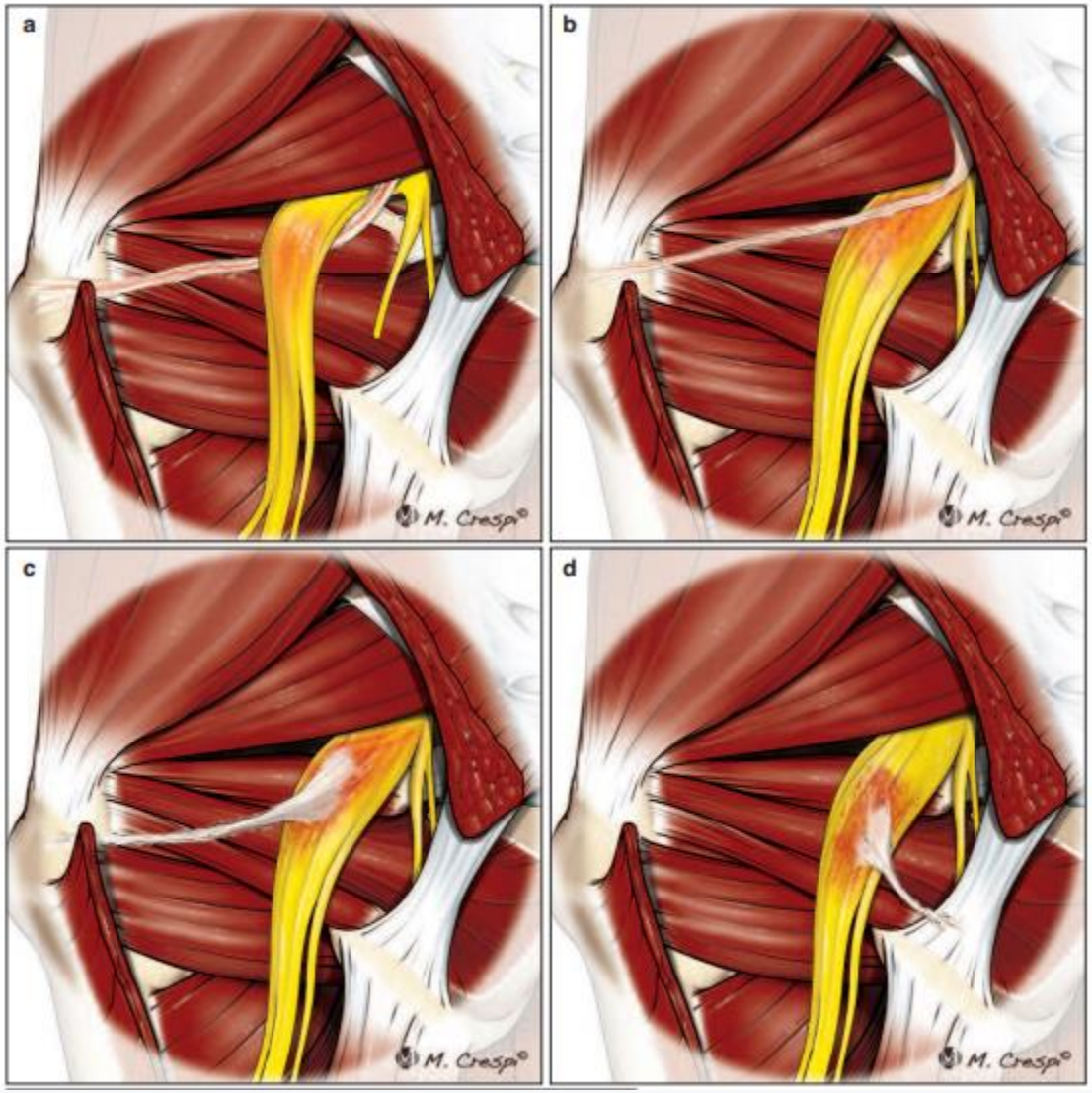
Sur d'autres études on observe :

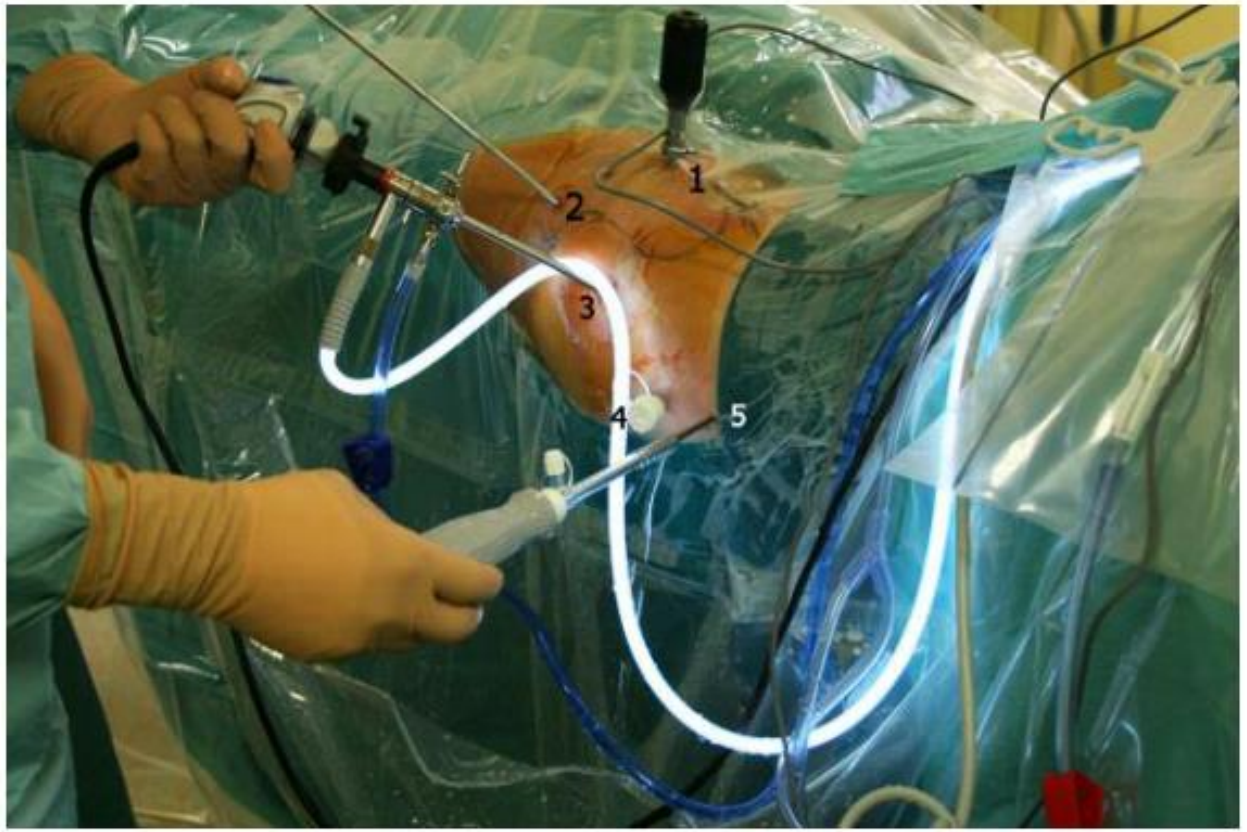


De la fibrose vraie

On ne peut rien faire avec nos mains ou des exercices dessus

Qu'observe t-on sous endoscopie ?





CARRO, Luis Perez, HERNANDO, Moises Fernandez, CEREZAL, Luis, *et al.* Deep gluteal space problems: piriformis syndrome, ischiofemoral impingement and sciatic nerve release. *Muscles, ligaments and tendons journal*, 2016, vol. 6, no 3, p. 384.

Toujours pas un problème de piriforme ?

JACKSON, Timothy J. Endoscopic sciatic nerve decompression in the prone position—an ischial-based approach. *Arthroscopy Techniques*, 2016, vol. 5, no 3, p. e637-e642.

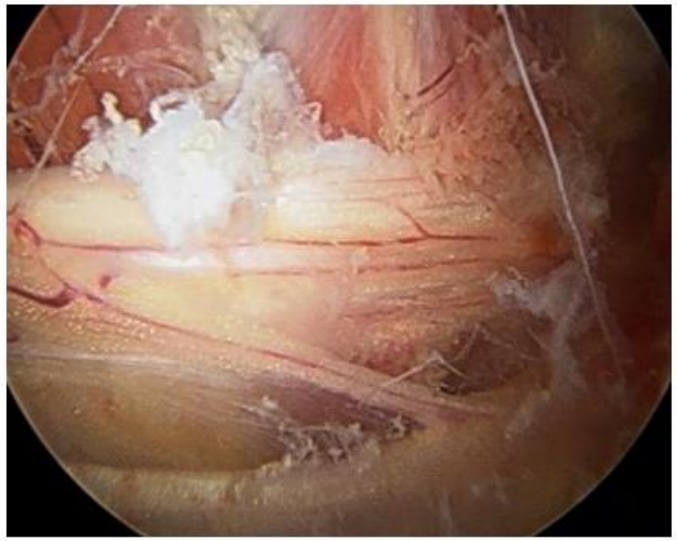


Figure 11. Left hip. Normal sciatic nerve with noticeable epineural blood flow.

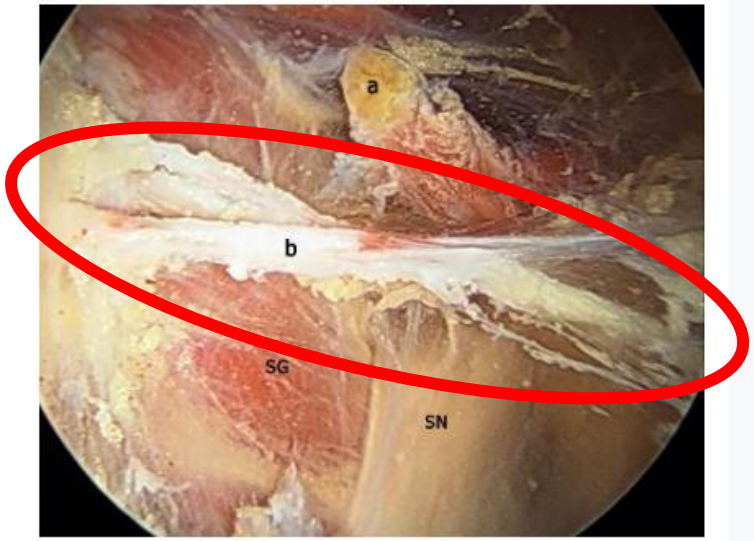


Figure 12. Left hip. Sciatic nerve at the sciatic notch. a) Piriformis tendon after release; b) fibrovascular band, SG Superior gemellus muscle, SN Sciatic nerve.

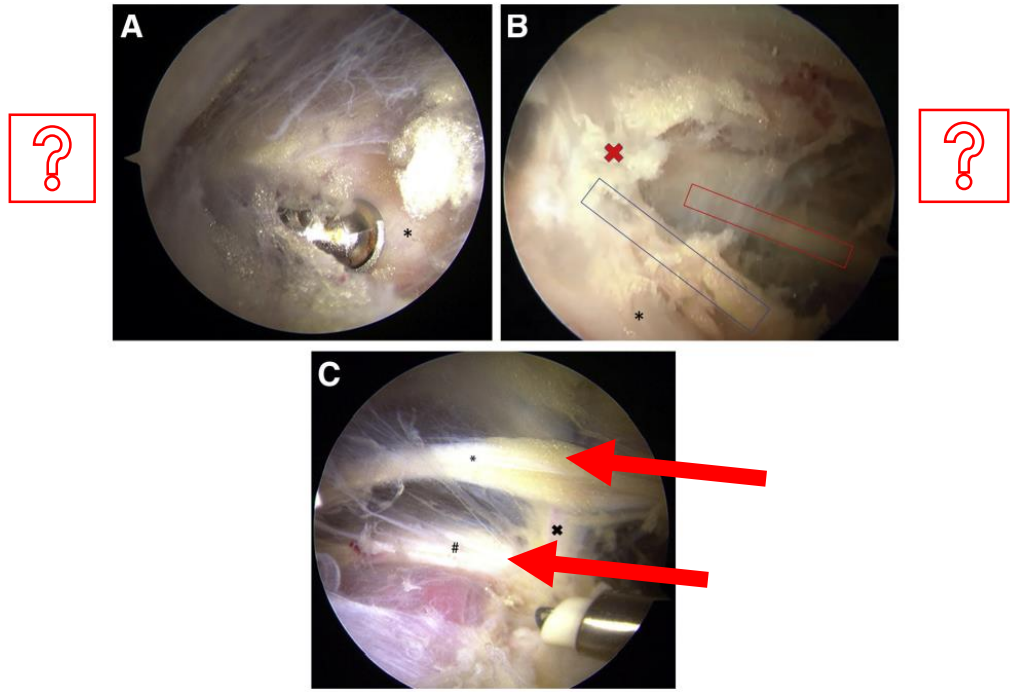
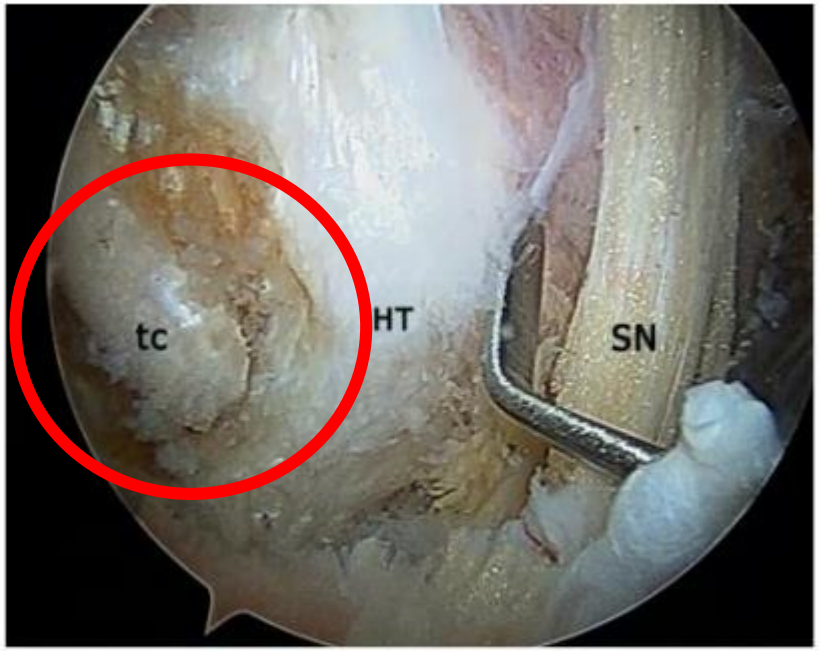


Fig 3. (A) Endoscopic view at the time of initial bursectomy with the hamstring tendon in the background (asterisk). The camera is in the lateral portal and the shaver in the medial portal. (B) Endoscopic view of the fibrous bands (red X), ischium (asterisk), and neural structures before decompression. The posterior femoral cutaneous nerve can be seen under some thin connective tissue (red rectangle). The blue box highlights the region where the sciatic nerve is located. At this early point in the dissection, the nerve is not visible. (C) Photo in the same view as in B. After release of the fibrous bands, the sciatic nerve (#) and the posterior femoral cutaneous nerve (*) can be seen in their entirety. A leash of vessels is visible traversing the deep gluteal space (x).

Toujours pas …



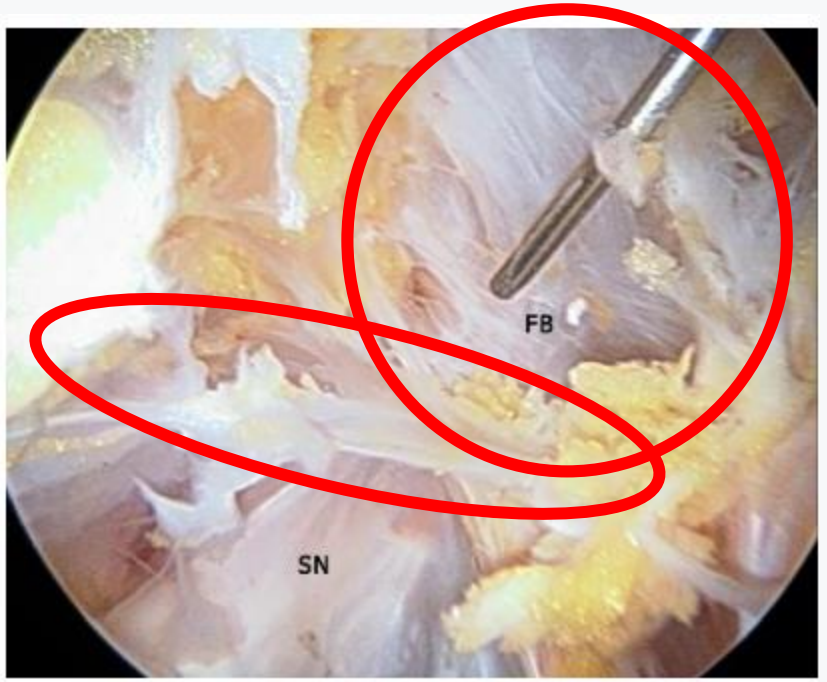


Figure 7. Right hip: Endoscopic image shows a severe degenerative calcifying tendinopathy of hamstring tendons with reactive sciatic neuritis. tc Calcifying tendinopathy, HT Hamstring tendons, SN Sciatic nerve.

Diagnostic différentiel, toujours pas de piriforme…

Implication rachidienne	Intra Pelvienne	Extra Pelvienne	Autre syndrome fessier profond
• Conflit disco radiculaire • Stenose foraminale • Sacro-Iliaque	• Coxarthrose • Bursite • Tendinopathie • Lésion labrum • Conflit fémoro acétabulaire	• Endométriose • Fibrome Utérin • Abcès tubo-ovarien • Cancer colo-rectal • Fistules • Diverticulose sigmoîdienne	• Hamstring syndrome • Tendinopathie ischio • Muscle supplémentaire • Neuropathies autres : Pudendal - glutéal inférieur-

Tumeurs, kystes, conditions gynécologiques, pseudoanevrismes d'artères de nerfs, thrombose de l'artère iliaque, fracture pelvienne…

Les critères de causalité de Bradford Hill 1965

- **Plausibilité biologique**
- **Cohérence biologique**
- **Données expérimentales**
- **Analogie**
- **Force de l'association**
- **Relation dose-effet**
- **Temporalité d'association**
- **Spécificité de l'association**
- **Reproductibilité des résultats**

Le syndrome du piriforme ou pas

Deep Gluteal Syndrom :

regroupe tout et n'importe quoi qui fait mal dans la zone fessière

Muscles trop court ou contracté : NON

Hypertrophie primaire : rare mais possible mais très rare

Dans la majorité des cas : pas de piriforme problématique

Deep Gluteal Syndrom

Conclusions

DGS is an underrecognized condition. Its etiology is multifactorial. Two common and underdiagnosed causes are fibrovascular bands and entrapment related to the external rotator muscles.

Piriformis syndrome can be classified as a subgroup of DGS, meaning that not all DGSs are piriformis syndrome.

MR imaging is the diagnostic procedure of choice for assessing DGS and may substantially influence management of these patients.

Perineural injections of the sciatic nerve with corticosteroid and local anesthetic have both a diagnostic and therapeutic function.

Endoscopic decompression of the sciatic nerve appears useful in improving function and diminishing hip pain in sciatic nerve entrapments within the subgluteal space.

Radiologists must be aware of the imaging anatomy and pathologic conditions of the subgluteal space as well as factors that predispose to or cause nerve injury.

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Conflict of interest The authors declare they do not have any conflict of interest.

Un piriforme problématique est un sous groupe RARE de douleurs de la région fessière qui sont un sous groupe RARE de présentation clinique de sciatalgie / radiculopathie

Syndrome : regroupe plusieurs conditions

Rien à voir avec la contractilité du Piriforme ou son raccourcissement.

Seule une hypertrophie vraie maladaptative peut obtenir ce terme

HERNANDO, Moisés Fernández, CEREZAL, Luis, PÉREZ-CARRO, Luis, *et al.* Deep gluteal syndrome: anatomy, imaging, and management of sciatic nerve entrapments in the subgluteal space. *Skeletal radiology*, 2015, vol. 44, no 7, p. 919-934.

Analysons vos cours et les pratiques observées

Ce que l'on sait

Ce n'est pas le piriforme qui prend les « tensions »

Cela n'invalide pas l'expérience des patients

Cela invalide le modèle théorique et optimise les traitements

Méfiance face à

Ouvrir Pubmed, Scholar, CINHAL, ScienceDirect, Sci-Hub

Avant de vouloir s'exprimer

Que retenir :

Pour une meilleure compréhension de nos pratiques, il faut savoir décrypter la littérature scientifique

Les examens complémentaires et la chirurgie sont utiles

Les critères diagnostics pour un DGS permettent d'identifier différentes affections qui nécessitent une vigilance +/- grande

<u>Ces patients ont réellement quelque chose mais pas ce que l'on pouvait penser, les solutions peuvent donc être plus adaptées</u>

Merci à vous

BRYAN LITTRE

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