

sensations and to respond to the hearing-tests which may be made from time to time during its progress. Under these conditions, in other words, the operative interference may terminate with the opening made in the membrana tympani if that seems advisable, or it may be intelligently continued to meet the ascertainable demands of the individual case.

RUPTURE OF THE PLANTARIS TENDON.

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ON account of its unusual appearance and doubtful use the plantaris muscle has always been an object of interest to anatomists, who have named it "elegant"¹ or "singular,"² according as its appearance or possible function made the stronger impression upon their minds. Of recent years, when the subject of muscle and tendon rupture has been better known, it has acquired a surgical importance, in that supposed ruptures of the gastrocnemius muscle proper, are now more often attributed to those of the plantaris tendon. Of this we shall have a word further on.

The plantaris has received various names, such as *soleus parvus*, *plantaris gracilis*, and *extensor tarsi minor*: it has, moreover, an historical interest in that Cardinal Richelieu³ is said to have suffered from its rupture. On first viewing this tiny structure imbedded between great masses of muscle having similar attachments, one is at a loss to give it a *raison d'être*. In spite of efforts to ascribe to it a useful function, such as withdrawing the posterior capsule of the knee-joint from between the femur and tibia in flexion, rotating the foot, etc., it seems more probable, especially in view of the fact that the rupture of the tendon is followed by no permanent ill effects, that it is of no use whatever, and that its sole effect upon the individual, for good or evil, like the vermiform appendix, is to create disability on occasion.

It is a remnant of a structure useful to certain animals, which Nature has left over and forgotten in ascending to a higher type. It corresponds to the *palmaris longus* of the upper extremity, and in some animals is actually a tensor of the plantar fascia. In man, the projecting *os calcis* effectually prevents it from having any such function.

Says an old anatomy of 1805: "This muscle has gotten its name of *plantaris*, from its being supposed to furnish the aponeurosis that comes from the sole of the foot, but it does not in the least contribute to the formation of that tendinous expansion." Again, "One of its uses is said to be to pull the knee capsule from between the bones and assist in rotating the foot outward."⁴ Maygrier⁵ calls it the *tibialis parvus*.

"This muscle may be altogether absent, as in the wombat. It may, however, be present as a large belly, and arise from the outer condyle of the femur, as in the pig and rabbit. It may, also, in the same animals, end in an expansion which runs along the sole and becomes the perforated tendons of the digits. This muscle may even be connected with the pelvis by the intervention of the *rectus femoris*, the tendon

of which is continued on into it, not only in birds, but in the alligator. It may be intimately connected with the outer head of the *gastrocnemius*, and fleshy bellies may replace the perforated tendons, as in the iguana."⁶

"Both origin and insertion may vary considerably. Arising from the outer part of the *linea aspera* and the posterior ligament of the knee-joint or from the outer condyle, it unites with the *tendo-Achillis* on the inner side, or with the *calcaneus* below, or it may end in the deep fascia of the leg."⁷ Speaking of varieties, Henle says further: "The *plantaris* is more often absent than its analogue, the *palmaris longus*." Other anatomists assert the contrary, Henle quoting Hallett, who found it present in all of 105 cadavers examined in regard to this point.

The muscle itself is described by different writers as two to four inches in length, is sometimes double, and sometimes, though rarely, wanting.

CASES OF PLANTARIS TENDON RUPTURE.

My own cases of this lesion are as follows:

CASE I. In August, 1884, a healthy married woman, about twenty-eight years old, was running in her bathing-suit along the beach at Fisher's Island, near New London, Conn., when she suddenly felt a severe pain in the calf, with loss of power in the left leg, and pain on flexion or extension. She was carried home; remained in bed five days, suffering some pain at first. There was tenderness on pressure over the middle of the calf, but no ecchymosis. Patient was out and limping about in a week; the lameness continuing a few days longer.

CASE II. B. L., a healthy athletic man, twenty-five years of age, while playing foot-ball and running diagonally across the field toward the left, dodged quickly to the right, using the left leg to stop and turn, when he felt acute pain in calf of left leg. The whole calf was painful; but there was a spot of tenderness on deep pressure just below the largest part of the calf. General stiffness and aching of the limb followed, with slight ecchymosis. Patient was able to walk without limping in about three weeks.

CASE III. J. P. S., manager of a large summer hotel, is fifty years of age, and weighs over two hundred pounds. Pale and stout. While stepping down and backward from the porch (about eight inches) to the tennis-court, in August, 1890, he felt a severe pain in the calf of the left leg; at the same time he thought he heard something snap. He limped into the house, suffering considerable pain. He was confined to his room for three days, and limped about for a week. There was ecchymosis and tenderness on the inner side of the calf.

CASE IV. H. C., a gentleman farmer, sixty-two years of age, stepped down from the curb to the gutter on Park Avenue, Baltimore, March 12, 1892, a distance of six to eight inches. At that instant he felt a severe pain in the middle of the calf of the left leg, as if he had been struck by a bullet. He involuntarily put his hand to see if there was much bleeding, and looked in vain for the ball, and then for a stick, which he thought might have struck him, end on. There was a good deal of aching and pain on motion. Patient kept his chair for four days, but was not free from pain or lameness for two weeks. There was in this case slight swelling of the calf, lo-

¹ Lizar's Anatomy.

² Horner's Practical Anatomy.

³ Hyrtl: Topographical Anatomy.

⁴ Pancoast's Wistar, 1842.

⁵ Maygrier's Anatomy, 1832.

⁶ Mivart: Lessons, 1872.

⁷ Henle: Anatomie.

calized pain in about the middle and inner side of the same, and some ecchymosis visible when I saw him at the end of one week.

TREATMENT.

In all four of these cases, rest was obtained and carried out for three to five days; the limb was snugly bandaged; and an evaporating lotion applied in the last two cases. The last three cases can walk perfectly; the first case has disappeared from observation. In none of these was there anything to be felt by the surgeon except a slight increase of tension in the calf of the affected leg as contrasted with the other. The ecchymosis appeared after several days, and was the only other physical sign. Apparently, the point of rupture in these cases was a little beyond the belly of the plantaris and in the tendon itself.

Sir Astley Cooper⁸ speaks of total and *partial* rupture of the tendo-Achillis; in the latter case he attributes symptoms, which we at the present time ascribe to plantaris rupture, to rupture of the gastrocnemius muscle, where it joins the tendo-Achillis.

Concerning rupture of tendons, Treves⁹ ascribes them to some sudden or involuntary action of the muscle. They are not uncommon in men after middle life, most frequent in the plantaris, tendo-Achillis and long biceps tendon. Often, he says, there is an audible snap in the case of the plantaris or Achillis-tendon rupture, with lameness or inability to walk. Sometimes also local extravasation.

When the long head of the biceps ruptures, the muscle contracts into a hard, dense lump, on putting it into action. Rupture of the inner head is said to soon follow that of the long one.

Bryant¹⁰ mentions a case where the short ruptured four months after the long tendon of the biceps, in a man past middle life. Again, in a boy of eight years, where the tendon of the biceps femoris was ruptured in an accident in connection with a cart. Another case where the plantaris tendon ruptured in a man of twenty-seven years, who stepped up two and a half feet with a heavy load on his back. He says the accident causes dragging and eversion of the foot.

Clarke and Barker¹¹ claim that the tendons most often ruptured are the tendo-Achillis, triceps humeri, and rectus femoris; while Henry Morris makes the order the following: ligamentum-patellæ, plantaris, tendo-Achillis, rectus tendon, and tendon of biceps femoris. He mentions as symptoms, sudden loss of power, and violent pain as if shot or struck a forcible blow, sometimes a sensation of tearing or an audible snap; again, no pain may be felt. Also that the plantaris may rupture from trivial causes.

Gross¹² and Miller¹⁴ both speak of a loud snap being heard when the plantaris tendon ruptures subcutaneously.

Before deciding that cases apparently similar are really due to plantaris rupture, we must exclude lesions of the other structures of the leg; first of all fracture of the fibula, and of all ways the best is pressure at a distance from the point of localized pain, when some abnormal mobility or crepitus will surely be felt in case of rupture. The local tenderness in

the tendon rupture is near the middle of the calf, while if the fibula is fractured near this point, firm intermittent pressure below will develop the characteristic signs of fracture. The subsequent course will surely develop the diagnosis, if that were in doubt, since any patient can walk to some extent in a week, with plantaris tendon rupture, but not with fractured fibula. Serious injury of a nerve-trunk may easily be eliminated by absence of paralysis and shooting pains, anæsthesia, formication, etc. Rupture of any vessel sufficient to cause the temporary disability of plantaris tendon rupture, would be followed by swelling of the leg, and effusion of blood far beyond anything we know of in these cases.

The only lesions this accident might be confounded with are ruptures of other muscles or tendons in the leg, and if only seeing is believing (and autopsies are practically unknown after this injury) we can seldom make a positive, but only a probable diagnosis. In cases of rupture of muscle-fibres in other parts of the body, there is no snap heard or felt, but rather a dull tearing sensation followed by aching pain, and some tenderness aggravated by motion.

VENTRAL FIXATION OF THE UTERUS.¹

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At a recent society meeting held in this city a discussion ensued on the merits of the Alexander operation, in which hysteropexy seemed to have almost been lost sight of.

I have no long series of cases to report (they being readily counted on one's fingers), nor any large experience from which I might abstract deductions of positive value, but the impressions gained from the above-mentioned meeting are so different from what I am led to believe are correct, that I venture to call your attention briefly to the subject of "Ventral Fixation of the Uterus."

As you are well aware, hysteropexy is no new procedure, but, like many another good thing in gynecology, has been formerly proposed, brought to the notice of the profession by prominent men, dropped into apparent obscurity, and again revived to attract the attention of the leaders in the surgical world.

Koerberlé, in 1869, sutured the uterus to the abdominal wall after having removed an ovary in a difficult case of retroflexion. Sims, Schroder, Tait, *et al.*, did similar operations in succeeding years; but Olshausen, a few years since, first proposed this method for retro-displacements *per se*, since which time many cases have been reported as being done, both for displacements alone and as an adjuvant to other measures.

On inquiry, I find the operation to be much in vogue in certain quarters of this continent and in Germany, while certain well-known men prefer it in *all* cases to the Alexander-Adams.

Fixation, as a complementary measure to the removal of a cyst, fibroma, ovary, etc., is, no doubt, frequently practised, and, I assume, has many supporters; but when done solely for retro-displacements or prolapse with distressing and disabling symptoms, is a matter to which I invite your discussion.

Practising in a community where the Alexander operation was being favorably commented on, as a young man I naturally selected this method in those

¹ Read before the Boston Gynecological Society, March 9, 1893.

⁸ Lectures by Sir A. Cooper and Green, edited by Castle, 1837.

⁹ Treves: Surgery, vol. ii.

¹⁰ Bryant: Surgery, p. 901.

¹¹ Holmes: Syst. of Surgery, vol. ii, p. 171.

¹² *Ibid.*, vol. i, p. 994.

¹³ Gross: Surgery, vol. i, p. 648.

¹⁴ Miller: Prin. Surgery, Phila., 1866.