

PREVASCULAR FEMORAL HERNIA.

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THERE are several reasons which induce me to place on record the case about to be described: (1) the exceeding rarity of this variety of femoral hernia; (2) the paucity of the anatomical description of this form of hernia; and (3) the chaotic state of the literature and nomenclature pertaining to all forms of hernia not of the classical femoral variety.

M. M., fifty years of age, a native of Roumania, was admitted to the Har Moriah Hospital, April 14, 1911. A deformity of the right foot was noted at birth, and the lame gait, which developed when he began to walk, was ascribed to that. Fifteen years ago he noticed a reducible swelling in the right groin; suspecting a rupture, he attempted to wear a truss, but this became so irksome that he soon discarded it. Gradually the hernia became larger and larger, but, with the exception of its bulk, caused him no inconvenience. After lifting a heavy weight, five days prior to his admission to the hospital, the hernia suddenly increased in size, and became irreducible. This was accompanied by sharp pain in the hernia; he vomited repeatedly, and his bowels became constipated; the constipation, however, was not absolute, as movements were obtained by the aid of high enemata.

On examination it was found that the right lower extremity is shorter by 2 to 3 cm., and slightly smaller than the left. The right foot shows a well-developed pes cavus. The right hip-joint reveals nothing abnormal, and is freely movable; X-ray is negative.

There exists a small paraumbilical hernia.

At the junction of the right thigh and abdomen, there is a large globular swelling of approximately semilunar shape. Its diameters are equal, and approximately ten inches in length. It

imparts a sensation of fluctuation, and is dull tympanitic on percussion. It is somewhat painful and very tender on pressure, particularly at the line of Poupart's ligament. The swelling is irreducible, and gives only a doubtful impulse on coughing (Fig. 1).

The attributes of this swelling were so unusual as to lead me to suspect that it was a femoral hernia, with some peculiar features. Because of its large size and the incarceration, it was impossible to determine whether we were dealing with a huge premuscular or prevascular femoral hernia.

The patient was operated upon April 14. A vertical incision, about four inches in length, was made, from Poupart's ligament downward over the most prominent part of the hernial protrusion, and the sac opened. A large amount of blood-tinged, non-odorous fluid escaped. The sac was found to contain several loops of small intestine. Their reduction was very difficult, but was finally accomplished by manipulation in Trendelenburg's posture.

The neck of the sac was elliptical in shape, and easily accommodated my four fingers, placed side by side; it extended from Gimbernat's ligament to about one inch external to the femoral artery.

The sac, much thickened and easily the size of a large coconut, was now freed from the surrounding structures and lifted upward. When this was done, a most interesting and unusual picture was revealed. All the structures of Scarpa's triangle, with the exception of the anterior crural nerve, were seen, as in a dissecting room specimen; the femoral artery and vein, naked and without their sheath, coursing downward for a distance of about four inches. No saphenous opening was made out.

The radical (?) closure of this huge ring was now proceeded with after a method described by me in the *New York State Journal of Medicine*, October, 1907. The upper end of the cutaneous incision was extended in an upward and outward direction for a distance of about five inches, and Poupart's ligament exposed. The transversalis fascia covering Hesselbach's triangle was incised parallel to Poupart's ligament, and the sac (previously liberated from below) pulled up, thereby converting the femoral hernia practically into a direct inguinal hernia. The neck of the sac was now closed by a continuous suture, and the redundant portion resected. (It is to be noted, that at no time did I come

into conflict with the deep epigastric vessels.) Poupart's ligament was now joined by four chromicized catgut sutures to Cooper's ligament; this closed off that portion of the ring extending from Gimbernat's ligament to the femoral vein. There still remained a fair sized hole, extending from the vein outward, but the closure of this was left to a later stage of the operation. The inguinal incision was now closed, as it is usually done in an inguinal hernia.

The opening, remaining to the outer side of the vessels, was closed in the following manner: Chromicized catgut sutures were passed, catching the under surface of Poupart's ligament anteriorly, and whatever fascial, muscular, and aponeurotic structures existed posteriorly, namely the psoas, iliacus, and pectineus muscles, beginning at the extreme outer end of the ring, and continuing as far as possible toward the femoral artery. This still left an opening, which was sufficiently snug to transmit without constriction the femoral artery and vein. No attempt was made to close this remaining portion of the ring; nor for that matter, do I see any possibility to do this. Closure of the skin.

I regret extremely that I did not (owing to pressure of time, the operation had already lasted an hour and a half) resect the redundant part of the skin, and this is still to be seen in the accompanying illustration (Fig. 2).

First dressing April 21. Primary union resulted and patient left the hospital seventeen days after operation.

In order to fully understand this form of hernia, a thorough knowledge of the anatomy of this region is of prime importance. I shall not review this phase of the subject in any detail. It may be of interest to relate that some of the anatomists of the last century, Hesselbach, Cloquet, and Sir Astley Cooper, have practically said the last word on the subject. There are, however, inherent to this form of hernia special points, not widely known or appreciated, which have been brought home to me in the study of my case, and to these I would invite attention.

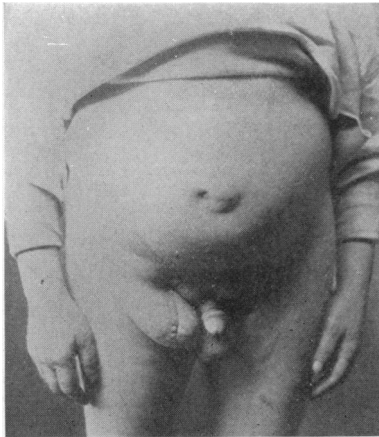
Primarily it is important to recall, that like all great vessels of the abdomen, the iliac vessels *lie upon* the transversalis fascia and are *covered by* the peritoneum. It follows, there-

FIG. 1



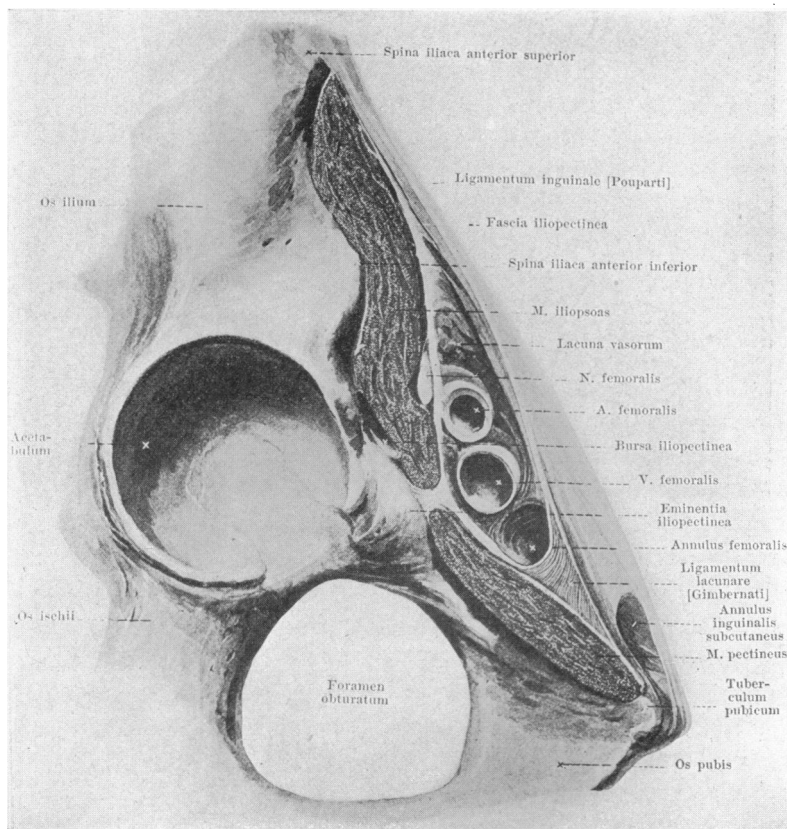
Prevascular femoral hernia, before operation.

FIG. 2.



Prevascular femoral hernia, after operation.

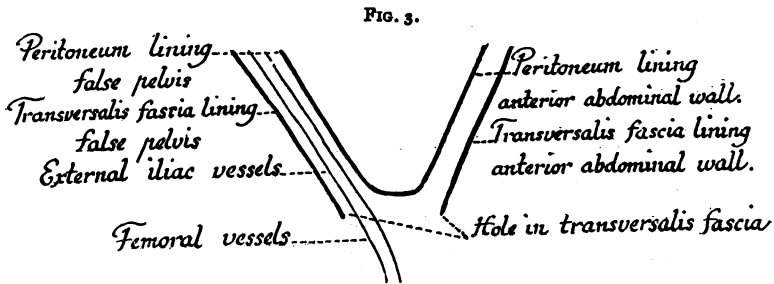
FIG. 5.



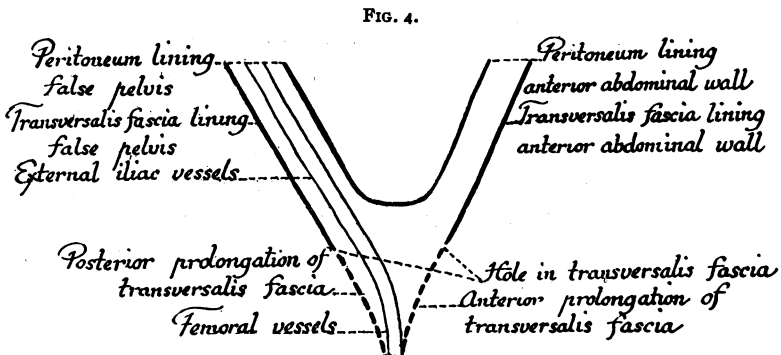
Cross-section of femoral region. (After Spalteholz.)

fore, that at that point where these vessels escape from the abdomen to the thigh, there must be an opening, or at least a weak spot in the transversalis fascia. To make this point clear, I have drawn the following diagram (Fig. 3).

This hole in the transversalis fascia, strictly speaking, does



not exist. Careful dissections have shown that the posterior or pelvic portion of the transversalis fascia is prolonged for some distance behind the vessels, while the anterior part of the transversalis fascia is prolonged for a similar distance in front of the vessels, finally both becoming blended with the vessel



wall. To be more accurate, therefore, the following would be a truer diagrammatic cross-section (Fig. 4).

This prolongation, however, is nevertheless a weak point, and constitutes an avenue for the escape of a hernia.

Fig. 5 represents a cross-section of the femoral region,

made parallel to Poupart's ligament, and is copied after Spalteholz. It is seen that the irregular space behind Poupart's ligament is divided into two halves, of which the outer one is called the lacuna muscularis, and gives passage to the iliopsoas and anterior crural nerve, while the inner one, called the lacuna vascularis, gives passage to the femoral artery and vein, leaving a practically empty compartment to the mesial side of the vein, containing only Rosenmüller's gland and lymphatic vessels, and which is the loculus of the usual variety of femoral hernia.

These being the theoretical anatomical substrata of a pre-vascular femoral hernia, let me now again recall the operative findings in my case, and see in how far the actual findings of a case compare with the findings as they should be in theory.

First of all, the hernial ring was oval, of a flattened shape, extending from Gimbernat's ligament up to about an inch to the outer side of the femoral artery, easily admitting my four fingers. Now this we never see in an ordinary femoral hernia; no matter how large the hernia, the hernial ring is usually small and round, and the fascial compartment to the outer side of the ring is so dense that not even the femoral vein, much less the artery, can ever be seen.

Second, long before I proceeded with the radical cure of my case, *i.e.*, just after I had peeled off the infrapoupartian portion of the sac, I was able to demonstrate to various visitors and my assistants a perfect anatomical exposure of at least five inches of the femoral artery and vein, which showed not the slightest trace of a covering. This, to my mind, is an absolute and incontrovertible proof that we had before us a pre-vascular femoral hernia. The conventional warning, not to injure the femoral vessels when passing the sutures, is not necessary in this form of hernia. The sight of these structures is sufficient.

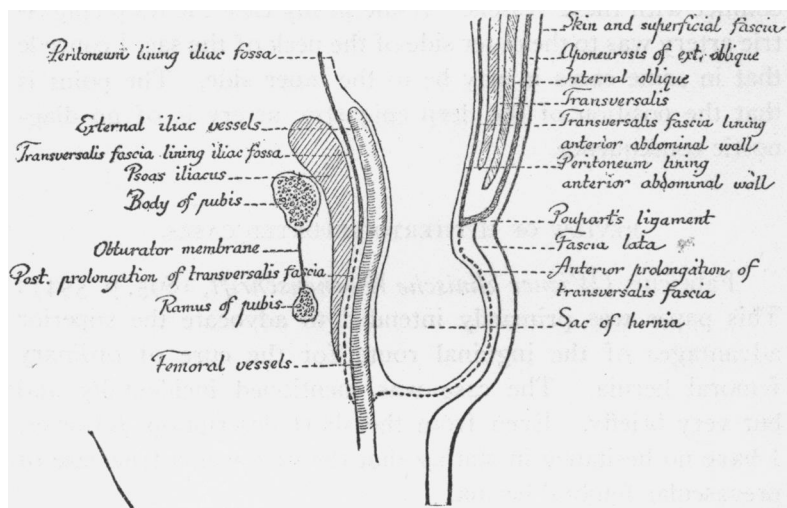
Anatomically, a cross-section of a prevascular femoral hernia can be represented by the following diagram (Fig. 6).

It is seen that the coverings of such a hernia are of the simplest, *viz.* : (1) skin and superficial fascia; (2) fascia lata;

- (3) prolongation of abdominal portion of transversalis fascia;
 (4) peritoneum.

Now all these were present and readily demonstrable during the operation. The important point to remember, however, is that the sac necessarily rests directly upon the femoral vessels. I contend that it is upon this anatomical fact, and this fact alone, so beautifully demonstrated in my case, that a diagnosis of prevascular femoral hernia can be made.

FIG. 6.



Cross-section of prevascular femoral hernia.

Deep Epigastric Artery.—The relation of the deep epigastric artery to this form of femoral hernia is of importance and interest. *Eo ipso* it is evident that the hernia, coming from above, must come into close relationship with the artery. Narath concedes this, and furthermore argues that as a part of the hernia becomes evident, even after stopping up of the femoral canal with the finger, therefore the deep epigastric artery must lie medially to the hernia.

But this is not necessarily so. The deep epigastric artery is rather tortuous in this part of its course, and lengthens or shortens itself, according to requirements. I believe the posi-

tion of the deep epigastric artery depends upon where the hernia *begins*; if the hernia originates on the outer side of the deep epigastric artery, then the artery is pushed toward the median line; if on the inner side, then the artery is pushed toward the outer side. In my case, I believe the deep epigastric artery was on the outer side, for the following reasons: that prior to deligating the neck of the sac, I made a pretty liberal incision through Hesselbach's triangle, and felt the deep epigastric artery to the outer side, but never again did I come into conflict with these vessels. While in my case the deep epigastric artery was to the outer side of the neck of the sac, I concede that in some cases it may be to the inner side. The point is that the position of the deep epigastric artery is of no diagnostic consequence.

REVIEW OF HITHERTO REPORTED CASES.

Fabricius (*Wiener klinische Wochenschrift*, 1895, p. 554): This paper was primarily intended to advocate the superior advantages of the inguinal route for the cure of ordinary femoral hernia. The case was mentioned incidentally and but very briefly. Even from the short description, however, I have no hesitancy in stating that the case was a true case of prevascular femoral hernia.

Zinner (*Deutsche Zeitschrift für Chirurgie*, vol. ciii, p. 137) reports a case of strangulated obturator hernia, which was complicated by a bilateral femoral hernia, and one of these proved on autopsy to be a prevascular femoral hernia.

In Teale's "A Practical Treatise on Hernia," London, 1846, I find the statement that Stanley met with two instances of prevascular femoral hernia in the cadaver. In each the sac was small, wide at the mouth, and empty. It passed out of the abdomen close to the femoral vessels, and was placed in front of them. I have not been able to trace this statement to its original source.

It is very surprising that in spite of the extreme rarity of this form of hernia, mention is frequently made in literature

of the possibility of such an occurrence (Pilcher, Bähr, etc.), but as far as I can ascertain, such cases were not recorded.

Conceding Stanley's two cases, our case, therefore, is the fifth, or if Stanley's cases are excluded, our case is the third, sufficiently rare, we believe, to merit a report.

These are the cases that I find recorded, and which, in contradistinction to those about to be described, may be called "spontaneous"; I refer to the six cases of Narath (*Archiv. für klinische Chirurgie*, vol. lix, p. 396): Über eine eigenartige Form von Hernia cruralis (prevascularis) im Anschlusse an die unblutige Behandlung angeborener Hüftgelenkverrenkungen.

Narath reports six cases of this form of hernia (two bilateral) after the bloodless reduction of 65 congenitally dislocated hips. It is only right to mention that considerable difficulty was met with to retain the head of the femur in the cotyloid cavity. Reluxations and anterior dislocations occurred with great frequency, requiring frequent narcoses and frequent manipulations. None of these cases were operated upon; hence exact anatomical proof is lacking. However, Narath's description is so perfect that, to my mind, there cannot be the slightest doubt that these six cases, although of a "traumatic" origin, are true cases of prevascular femoral hernia. Into this group there very probably also belongs the case published by Borchart (*Deutsche Zeit. f. Chir.*, vol. lxvi, p. 572).

My case is of especial interest, particularly in connection with Narath's contribution. The patient is lame and has a peculiar walk. This is to be accounted for by a shortening of the right lower extremity to the extent of 2 cm., slight atrophy, and by the presence of a shorter foot and a well-marked pes cavus. In view of Narath's cases, I suspected that we were also dealing with a congenital dislocation of the hip, but there is no trace of such deformity to be seen, either by examination or by X-ray. I have no doubt that the presence of the prevascular femoral hernia in this case is due in a great measure, if not wholly to the congenital deformity of the lower extremity, though it is difficult to explain satisfactorily this relationship.

DIFFERENTIAL DIAGNOSIS BETWEEN PREVASCULAR FEMORAL
HERNIA AND OTHER ABNORMAL VARIETIES OF
FEMORAL HERNIA.

Just a word or two regarding the differential diagnosis of prevascular femoral hernia and other forms of femoral hernia, in order to show what were the criteria which prompted me to accept some and exclude other cases.

1. Hesselbach's hernia passes to the outer side of the femoral artery, lying wholly in the lacuna muscularis.

2. Cloquet's hernia passes through the femoral canal to the inner side of the femoral vein; it, however, does not, like an ordinary femoral hernia, escape from the saphenous opening, but spreads out upon the pectineus, and is covered by the fascia lata.

3. Laugier's hernia escapes through a defect in Gimbernat's ligament.

4. In some articles I find mentioned a retrovascular femoral hernia. I deny, however, the possibility of such an occurrence.

As far as I could ascertain in a careful search of the literature, the case here reported is the first case of prevascular femoral hernia operated upon and studied *in vivo*.