

# FEMORAL HERNIA

REPORT OF NINETY OPERATIONS

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FEMORAL hernia, compared with inguinal hernia, is rare. Some idea of the relative frequency is obtained by referring to our records of the Henry Ford Hospital. During the 20-year period, 1916 to 1936, there were 241,037 admissions to the Henry Ford Hospital, and of this number, we have performed 4,530 operations for inguinal hernia and 90 operations for femoral hernia, giving a ratio of approximately 50 to 1, and an average of three femoral herniae a year.

A study of these 90 operative cases of femoral hernia, 88 primary and two recurrent, was undertaken for the purpose of estimating the end-results and comparing the operative procedures employed at this hospital. The literature on femoral hernia is replete with descriptions of variations in operative technic, but is deficient in records of the end-results. This shortcoming is not surprising when it is pointed out that, with but few exceptions, the total number of femoral herniae coming under the observation of any one surgeon is relatively small.

*Sex Incidence.*—The usual statement that femoral hernia is more common in women than in men is not borne out in this series, for, as shown in Table I, the males outnumber the females by 50 per cent. This difference may be due to the fact that the bulk of our hernia practice is industrial in character, and, as such, contains a greater proportion of males than exists in groups of patients drawn from the nonindustrial elements of the population.

TABLE I  
SEX INCIDENCE

	No. of Patients	Percentage
Male.....	54	60.0
Female.....	36	40.0
Totals.....	90	100.0

*Age Incidence.*—The age incidence of the patients is shown in Table II. The youngest patient was a nine-year-old girl, with a small femoral hernia, and the oldest was a 92-year-old woman, with a strangulated femoral hernia. The greatest number of patients, 76.7 per cent, were in the fourth, fifth and sixth decades, *i.e.*, between the ages of 30 and 60. This is a period of greatest physical activity, but at a time of life when degenerative processes are be-

ginning to exhibit themselves. In a recent review of inguinal herniae,<sup>5</sup> it was shown that 80 per cent of inguinal herniae appeared in the third, fourth and fifth decades, *i.e.*, between the ages of 20 and 50. The appearance of femoral hernia at one decade later than inguinal hernia suggests that muscular weakness is an important factor in the etiology of femoral hernia.

TABLE II  
AGE INCIDENCE

Age Group	Decade	No. of Patients	Percentage
0-9.....	1	1	1.1
10-19.....	2	3	3.3
20-29.....	3	6	6.7
30-39.....	4	25	27.8
40-49.....	5	29	32.2
50-59.....	6	15	16.7
60-69.....	7	8	8.9
70-79.....	8	2	2.2
80-89.....	9	0	0.0
90-100.....	10	1	1.1
Totals.....		90	100.0

*Truss.*—Only nine patients, or 10 per cent of the total, had worn a truss previous to operation.

*Trauma.*—Twenty-two patients, or 24.4 per cent of the series, gave a definite history of trauma in connection with the appearance of their hernia. This figure is low in comparison with that of 62.1 per cent obtained in our series of inguinal herniae.

*Obesity.*—Increased preperitoneal fat does not appear to be a factor in the production of femoral hernia since, as shown in Table III, two-thirds of the patients in the series weighed less than 150 pounds, and one-third less than 125 pounds.

TABLE III  
WEIGHT OF THE PATIENTS

Weight	No. of Patients	Percentage
100-124.....	29	32.2
125-149.....	30	33.3
150-174.....	27	30.0
175-200.....	4	4.5
Totals.....	90	100.0

*Incidence of Pregnancies.*—There were 36 females in the series, of whom 22, or 61.1 per cent, had one or more full term pregnancies and 14, or 38.9 per cent, had not been pregnant. The findings in Table IV are, therefore, inconclusive regarding the influence of child-bearing on the etiology of femoral hernia.

*Associated Inguinal Hernia.*—There were 21 patients in this series representing 22.3 per cent of the total who had been operated upon previously for

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inguinal hernia on the same side as the femoral hernia appeared. Some of these patients, no doubt, were subjected to two operations because of a diagnostic error, but this finding suggests that a more than casual relationship exists between femoral and inguinal herniae and tends to support the congenital or preformed saccular theory of femoral hernia. This observation also directs attention to the advisability of examining the femoral canal during all operations for inguinal hernia.

TABLE IV  
INCIDENCE OF PREGNANCIES

No. of Pregnancies	No. of Patients	Percentage
0.....	14	38.9
1.....	6	16.7
2.....	10	27.8
3.....	2	5.5
4.....	3	8.3
5.....	0	0.0
6.....	1	2.8
Total females.....	36	100.0

*Duration of Hernia before Operation.*—Table V indicates the present-day trend toward early operation, for here it is shown that 57.8 per cent of the patients were operated upon within one year of the appearance of their femoral herniae.

TABLE V  
DURATION OF HERNIA BEFORE OPERATION

Time	No. of Patients	Percentage
Up to one month.....	24	26.7
1 to 6 mos.....	15	16.7
6 mos. to 1 yr.....	13	14.4
1 to 2 yrs.....	13	14.4
2 to 5 yrs.....	15	16.7
5 yrs. plus.....	10	11.1
Totals.....	90	100.0

*Side Involved.*—Just as in inguinal hernia, we find that femoral hernia is more common on the right than on the left side, but the difference is more pronounced in femoral than in inguinal herniae. The ratio between right side and left side in our series of cases is 70 to 30 in femoral hernia and 55 to 45 in inguinal hernia. A satisfactory explanation for this predilection is wanting.

*Incarceration and Strangulation.*—A total of 21 patients, or 23.3 per cent of the series, was admitted for emergency operations because of incarceration, while only 1.4 per cent of our inguinal herniae were incarcerated. This comparison points out the greater potential danger of untreated femoral herniae, the seriousness of which is emphasized by the observation that in

eight cases, or 36.4 per cent of the incarcerations, there was interference with the blood supply of the intestine. This strangulation necessitated resection in three patients, two of whom died. One other patient who was operated upon for strangulation died of shock, making a total of three deaths out of 21 incarcerated cases, giving a mortality rate for the group of 15.2 per cent. It is recognized that the sac wall alone may strangulate and become gangrenous, but this condition was not observed in any of the cases in our series.

TABLE VI  
SIDE INVOLVED

Side Involved	No. of Patients	Percentage
Right.....	63	70.0
Left.....	27	30.0
Totals.....	90	100.0

*Diagnosis.*—A correct diagnosis of femoral hernia was made in 74 out of 90 patients, a percentage of 82.2. The principal error was in mistaking a femoral for an inguinal hernia. In males, there should be no great difficulty, except in dealing with recurrent inguinal hernia, where the protrusion of the sac does not always appear at the external inguinal ring. In obese females, the excess subcutaneous fat not uncommonly renders identification of anatomic landmarks extremely difficult, so that it may be impossible to determine whether the hernial sac appears internal and above the pubic spine, as in inguinal hernia, or external and below the pubic spine, as in femoral hernia. The observation has been made that in cases of doubt the hernia usually turns out to be femoral. The failure to distinguish between inguinal and femoral herniae is not of serious import in any instance, and is of no consequence if the inguinal approach to femoral hernia is practiced.

*Anesthetics.*—Table VII illustrates the growing popularity of spinal anesthetics in this hospital. However, we feel that local anesthesia is the choice for the poor-risk patient.

TABLE VII  
ANESTHETICS EMPLOYED

Type	No. of Patients	Percentage
Spinal.....	31	34.4
Ethylene and ether.....	28	31.1
Ethylene.....	15	16.7
Local.....	7	7.8
Avertin and ethylene.....	5	5.6
Ether.....	2	2.2
Nitrous oxide and ether.....	2	2.2
Totals.....	90	100.0

*Method of Repair.*—The classic operation of Bassini for femoral hernia was performed in 60 per cent of the patients, with a recurrence rate of

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9.7 per cent. The high or inguinal route for both treatment of the sac and repair of the canal was adopted in 30 per cent of the patients, with a rate of recurrence of 7.4 per cent. The combined method of inguinal treatment of the sac and the femoral or low approach for the repair of the canal was employed in 10 per cent of the patients, with no recurrences. The use of the combined method arose in most instances from diagnostic error where a femoral hernia was diagnosed as inguinal hernia, preoperatively. The inference drawn from the foregoing figures is that the inguinal route gives better results than the femoral, but if we include the combined repair with the femoral group, the recurrent rate would then be 7 per cent, giving a slight advantage in favor of the femoral approach.

TABLE VIII  
METHOD OF REPAIR

Approach	No. of Patients	Percentage	No. of Recurrences	Percentage
Femoral.....	54	60.0	5	9.7
Inguinal.....	27	30.0	2	7.4
Combined.....	9	10.0	0	0.0
Totals.....	90	100.0	7	

The inguinal operation employed was that of Lotheissen,<sup>8</sup> *i.e.*, suturing the conjoined tendon to Cooper's ligament, in an endeavor to close the superior orifice of the femoral canal. The conception of this operation is anatomically sound, and whether the conjoined tendon, the mobilized rectus sheath, the external oblique aponeurosis, or the transversalis fascia<sup>3</sup> is sutured to Cooper's ligament, a firm barrier is placed over the femoral opening at the conclusion of the operation. The ultimate success of the operation depends, however, on sound healing of the opposed structures. The failure of the conjoined tendon to unite with Cooper's ligament is witnessed by the number of operative failures and the many modifications suggested. The lack of success is due, in part, to the placing of the structures out of their normal course of alignment and in part to the necessity for suturing under tension.

The Moschcowitz operation<sup>10</sup> consists of an attempt to approximate two relatively unyielding structures, Poupart's and Cooper's ligaments. A firm fibrous union between these structures can be obtained only when Poupart's ligament is lax enough to permit apposition to Cooper's ligament, without tension. This prerequisite limits the application of this type of repair. The Roux operation achieves the same result by inserting a metal staple through Poupart's ligament and driving it home into the superior ramus of the pubic bone.

The problem of closing the entrance to the femoral canal appears to be best solved by the use of fascial strips as advocated by Auchincloss,<sup>1</sup> Carscadden<sup>2</sup> and Payne.<sup>11</sup> Strips of fascia obtained from the fascia lata or from the aponeurosis of the external oblique muscle are threaded through Poupart's and Cooper's ligaments from Gimbernat's ligament outward to the femoral vessels, thereby forming an effective barrier against peritoneal protrusions.

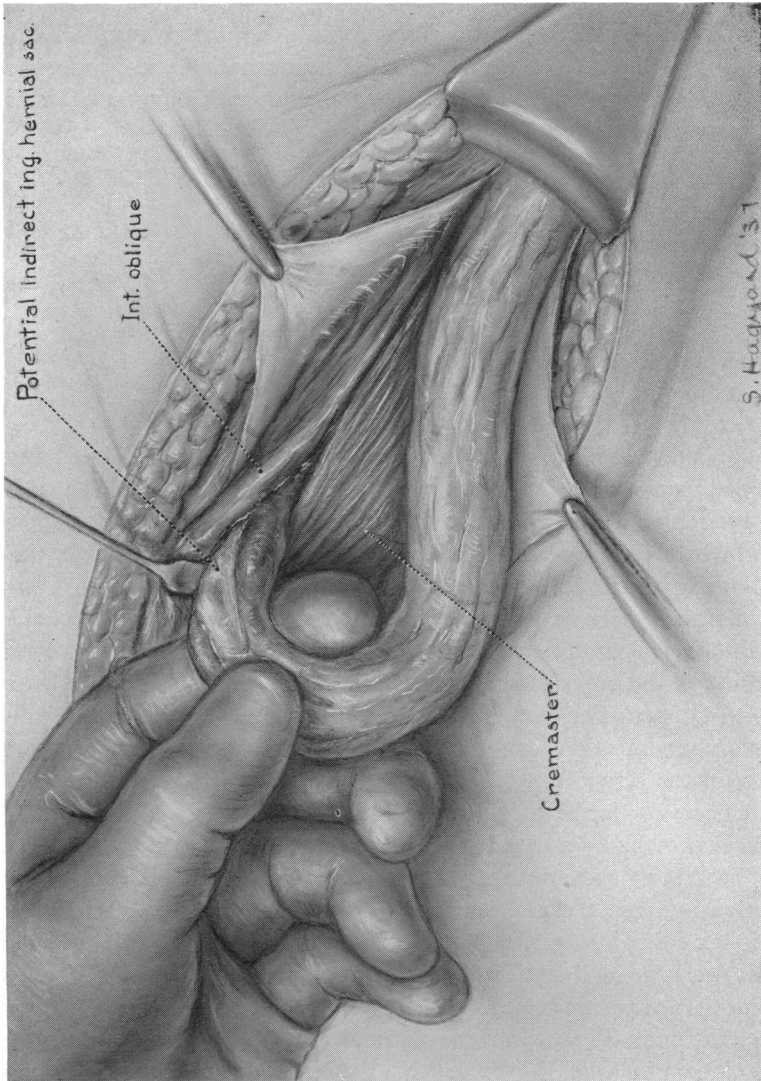


FIG. 1.—The spermatic cord has been dislocated from its bed. Retraction of the internal oblique and transversalis muscles at the internal inguinal ring plus traction on the cord has displayed the potential, indirect inguinal hernial sac.

We did not make use of this method in any of the cases in this series, but in consequence of dissatisfaction with our results, we are now utilizing this type of repair in large femoral herniae with the hope of reducing our recurrent rate of 7.4 per cent.

The femoral approach provides ready access to the sac of a femoral hernia, and the classical Bassini operation is much easier to perform than the inguinal operation. Satisfactory results follow the application of the Bassini repair in small femoral herniae when the sac contains only peritoneal fluid or at most a tag of omentum. However, when the femoral hernial sac is large and contains omentum or intestine, better results will follow the use of the inguinal operation.<sup>12</sup> The weakness of the femoral operation lies in the closure of the lower instead of the upper end of the femoral canal. The inguinal operation, while, admittedly, more difficult to perform, is actually a safer procedure than the femoral operation, because the chance of wounding an aberrant obturator artery or the bladder is reduced to a minimum. All incarcerated femoral herniae should be dealt with by the inguinal approach so that adequate inspection of the imprisoned intestine may be made. It is possible, when manipulating the sac below Poupart's ligament, for an unobserved loop of intestine with a damaged blood supply to slip back into the abdominal cavity and to be followed by perforation and a fatal peritonitis. Furthermore, if intestinal resection is indicated, the involved segment of bowel can be resected and an anastomosis made without the necessity of either making a second incision or sectioning Poupart's ligament.

It is desired to call attention here to a modification of the usual method of entering the peritoneal cavity when performing the inguinal operation for femoral hernia. One of the arguments brought forth against the inguinal approach is the difficulty of isolating the hernial sac. The method about to be described simplifies the procedure and eliminates the tedious dissection necessary to separate the transversalis fascia from Poupart's ligament and to identify the fat-covered neck of the sac. Also, the possibility of wounding the femoral vein is practically excluded. The modification suggested is an adaptation to femoral hernia of Hogue's<sup>6</sup> method of dealing with a direct hernial sac. It is employed in the following manner:

After the aponeurosis of the external oblique muscle is opened in the line of the inguinal canal, the cord or round ligament, as the case may be, is dissected from its bed. Gentle traction applied to the cord, plus upward and outward retraction of the internal oblique and transversalis muscles to expose the internal ring, will display the constant, potential indirect inguinal hernial sac. It may be recognized readily on the postero-internal aspect of the cord by its crescentic border (Fig. 1). This potential indirect hernial sac is picked up, separated from the other structures of the cord and opened to permit the examining index finger of the surgeon to enter the peritoneal cavity and verify the diagnosis of femoral hernia (Fig. 2). The medial margin of the opened peritoneum is now grasped with artery forceps, and by means of traction, it will be found possible to deliver the entire femoral hernial sac into the wound

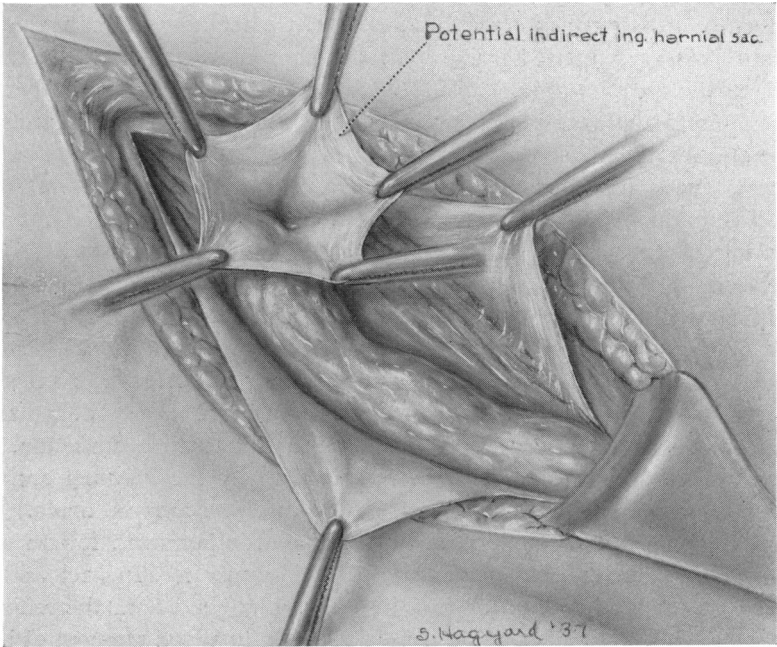


FIG. 2.—The potential indirect inguinal hernial sac has been separated from the structure of the spermatic cord and opened.

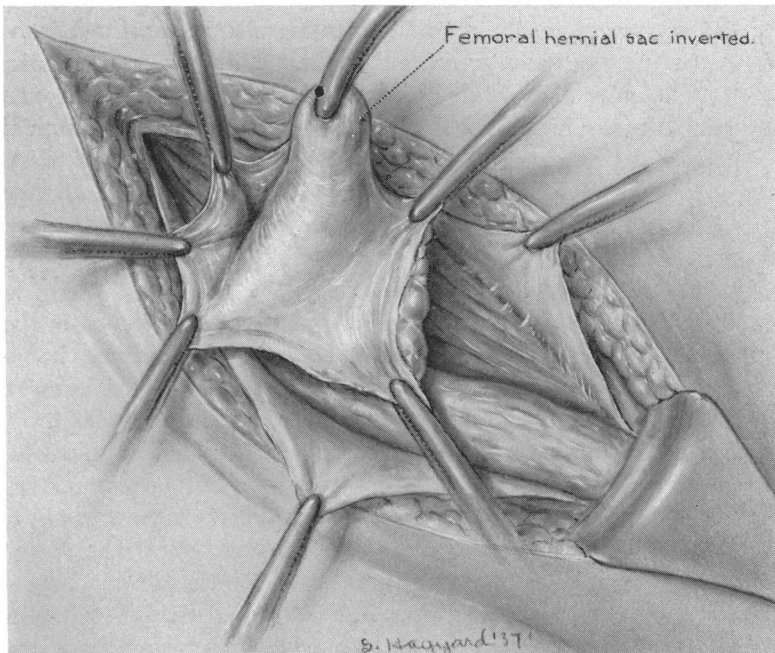


FIG. 3.—Traction on the medial margin of the sac has resulted in pulling up the slack peritoneum and with it the femoral hernial sac which has been inverted.



(Fig. 3). Even large sacs, after reduction of their contents, can be brought up through the femoral canal with ease. In some instances adhesions of the sac to the structures in Scarpa's triangle, or edema of the preperitoneal fat surrounding the sac, will prevent its passage through the femoral canal. In these cases the temptation to section the neck of the sac above Poupart's ligament and leave the body of the sac in situ below must be resisted because, though the hernia is cured, the bulk alone of the remaining sac, even if it does

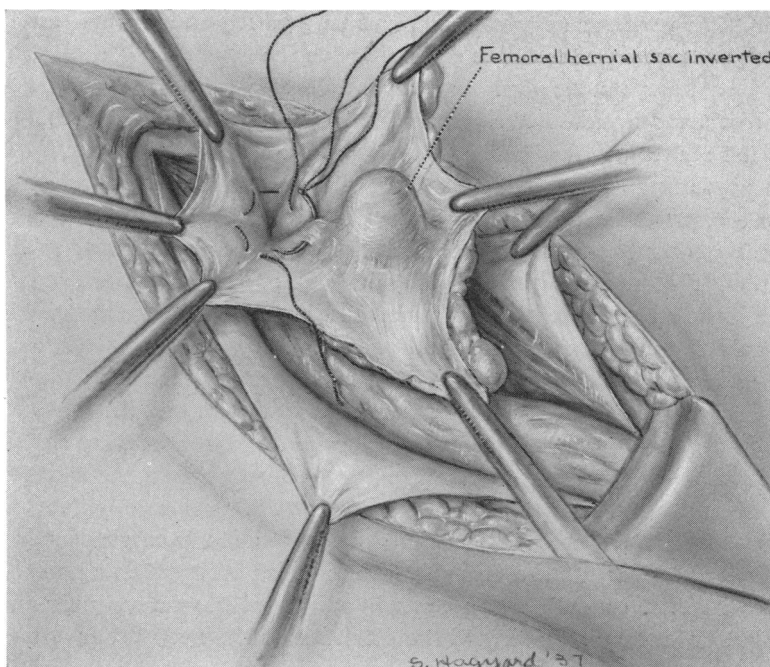


FIG. 4.—A purse-string suture of silk is closing the peritoneum proximal to the neck of the femoral hernial sac. The latter will be cut away with the remaining redundant peritoneum.

not fill with fluid, will suggest to the patient that the hernia is still present. The procedure recommended in these cases is to retract the lower skin flap and remove the sac below Poupart's ligament and, when this is done, the neck of the sac can be pulled through the femoral canal and delivered into the wound above Poupart's ligament. Closure of the peritoneum is effected by a purse string or continuous suture inserted proximal to the mouth of the femoral hernial sac (Fig. 4). After the excess peritoneum, including the femoral hernial sac, is trimmed away, the neck of the sac retracts back through the internal inguinal ring. It is now necessary to incise the fascia transversalis in the floor of Hesselbach's triangle in order to expose the superior opening of the femoral canal. In many instances, and in all obese patients, the canal will be found partially occupied by preperitoneal fat which surrounds the sac in addition to its usual fatty envelope. When this fatty tissue is pulled up through the femoral canal, the superior opening is perfectly displayed, Cooper's liga-

ment posteriorly, Poupart's ligament anteriorly, Gimbernat's ligament medially, and the femoral vein laterally. The operator now proceeds to close the femoral canal, using his favorite method. When this is accomplished, the incision in the transversalis fascia must be repaired in order to effectively close the floor of Hesselbach's triangle and prevent the formation of a direct inguinal hernia. The operation is completed by uniting the conjoined tendon and internal oblique to Poupart's ligament behind the cord, and then closing the external oblique aponeurosis over it. This approach has its special adaptation in dealing with strangulated and incarcerated femoral herniae, for, by this method, the peritoneal cavity is entered above the constricting ring. Furthermore, by pulling up the slack peritoneum a sufficiently large opening can be made to allow adequate inspection of the incarcerated intestine without weakening the abdominal wall or endangering surrounding structures.

In presenting this method of entering the peritoneal cavity above the neck of the sac, no claim for originality is made. It has undoubtedly been employed by others, but we have been unable to find any reference to it in the literature. Its use in 20 cases by one of us (L. F.) has confirmed our impression of its advantage over the usual method of approach to the sac of a femoral hernia when performing the inguinal operation.

*Unusual Contents of the Sac.*—In three cases of this series, the femoral hernial sac contained a viscus other than the omentum and intestine. In one case a fallopian tube was adherent to the sac and in two instances the sac contained the appendix. Watson,<sup>13</sup> up to 1923, collected from the literature 181 cases of an appendix in a femoral hernial sac, of which only four were in males. Since 1923, we have obtained 11 additional case reports from the American and British literature, only one of which occurred in a male.<sup>4</sup> Thus, of a total of 192 cases of appendicitis in a femoral hernial sac only five were in males. The extreme rarity of the condition in the male prompts us to add the following case report:

**Case Report.**—H. F., age 68, was admitted as an emergency to the Henry Ford Hospital, November 26, 1932. He gave a history of having been first aware of distress in the right lower quadrant of the abdomen seven days previously. At the same time, he had noticed a lump in his right groin which had increased in size after the application of a hot water bottle. He had been nauseated only once and that at the onset of the pain. He had not been confined to bed, although his activities had been restricted and he had experienced some pain on walking. Early on the day of admission, he was seen on the outside by one of us (R. D. M.) and a diagnosis of incarcerated femoral hernia was made, but, because there was so little systemic reaction, operation was not pressed. The swelling in the groin, which measured 4.5x3.5 cm. in size, was tender on examination. W.B.C. 9,400, polymorphonuclears 60 per cent. Later in the day operation was advised, and was performed early in the evening. The patient was otherwise in excellent health and fine physical condition.

*Operation.*—November 26, 1932: Under avertin-ethylene anesthesia, an incision, parallel to Poupart's ligament, disclosed a thickened, discolored, femoral hernial sac. On opening the sac, its only content was a tightly packed in, adherent, gangrenous appendix. Fortunately, the mobility of the cecum permitted a routine removal of the appendix with purse-string inversion of its base, but in order to deliver the cecum into the wound,

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Poupart's ligament had to be partially incised. A high ligation of the sac with a purse-string suture of silk and closure of the femoral opening by uniting the remnants of Poupart's ligament to the pectineal fascia and muscle completed the essential steps of the operation. This patient would not remain in bed—walking into the bathroom each day, including the first postoperative day. Convalescence was uneventful. It is now six years since the operation and there has been no recurrence of the hernia in spite of the fact that Poupart's ligament was partially severed.

*Treatment of the Hernial Sac.*—The method of dealing with the hernial sac is outlined in Table IX. The favorite method of closing the sac was by purse-string suture, which was done in 52.2 per cent of the cases. Twisting the neck of the sac before transfixion was done in 24.5 per cent, and transfixion alone in 23.3 per cent of the cases. The method of closing the sac in this series had apparently very little bearing on the success of the operation, for, of the seven recurrences, four followed purse-string sutures, two transfixion alone and one twisting. The better showing following twisting of the sac must be discounted because this maneuver was carried out only when the hernial sac was small. The neck of the sac, after closure, was transplanted and fixed to the anterior abdominal wall in 16.7 per cent of the cases, and was followed by recurrence in two instances.

TABLE IX  
TREATMENT OF THE HERNIAL SAC

Closure	No. of Patients	Percentage
Purse-string.....	47	52.2
Twisting.....	22	24.5
Transfixion.....	21	23.3
Totals.....	90	100.0
Transplanted.....	15	16.7

*Suture Material.*—As indicated in Table X, we used silk in all femoral herniae repairs unless there was a definite contraindication to its use. Thus we find that in 72.8 per cent of the operations the suture material used was silk. Catgut was used in most strangulated cases when the possibility of resection was present and when the condition of the skin was such that healing might be impaired. There were six recurrences among the 65 cases repaired with silk, a percentage of 9.2, and only one recurred among the 25 cases repaired with catgut, a percentage recurrence of four. No inference regarding the relative values of the suture materials can be drawn from these figures because the series is too small and because the other factors determining recurrence should be taken into consideration.

TABLE X

Type	No. of Patients	Percentage
Silk.....	65	72.2
Catgut.....	25	27.8
Fascia.....	0	0.0
Totals.....	90	100.0

*Complications of Operation.*—Complications following operation for femoral hernia, as shown in Table XI, developed in four patients, a percentage of 4.4. This compares favorably with the 5 per cent figure obtained in our series of inguinal herniae. The complications arising were: Phlebitis, two; pulmonary, one; and wound infection, one. All the patients recovered.

TABLE XI  
COMPLICATIONS OF THE OPERATION

Complication	No. of Patients	Percentage
Phlebitis.....	2	
Pulmonary complications...	1	
Wound infection.....	1	
Total.....	4	4.4
Operative mortality.....	4	4.4

The mortality rate of 4.4 per cent, following operation for femoral herniae was much higher than that of 0.24 per cent following operation for inguinal herniae. Of the four deaths in the series, two followed intestinal resection in strangulated cases, in patients being aged 90 and 72, respectively; and two followed additional operative procedures. We strongly deprecate the practice of performing multiple operations. All our case reviews indicate that both mortality and morbidity are increased when the patient is subjected to more than one operative procedure at one time.

*Follow-Up.*—The results of our efforts to trace the patients upon whom we have operated for femoral hernia are outlined in Table XII. We realize that the presentation of a rate of recurrence of 7.8 per cent, in a series of patients, 45.5 per cent of whom were followed for less than six months, is only an estimate of the true figure which must be considerably higher.

TABLE XII  
FOLLOW-UP

Time	No. of Patients	Percentage
Under 6 mos.....	41	45.5
6 mos. to 1 yr.....	13	14.5
1 to 2 yrs.....	10	11.1
2 to 3 yrs.....	7	7.8
3 to 4 yrs.....	1	1.1
4 to 5 yrs.....	1	1.1
5 to 6 yrs.....	4	4.5
6 to 7 yrs.....	0	0.0
7 to 8 yrs.....	1	1.1
8 to 9 yrs.....	0	0.0
9 to 10 yrs.....	1	1.1
Recurrence.....	7	7.8
Mortality.....	4	4.4
Totals.....	90	100.0

SUMMARY

(1) Ninety operations for femoral herniae are reviewed, with a known rate of recurrence of 7.8 per cent.

(2) The ratio of femoral to inguinal herniae at the Henry Ford Hospital is 1 to 50.

(3) The males outnumbered the females three to two.

(4) A modification of the usual approach to the sac is described.

(5) The relative merits of the femoral and inguinal operations for repair are discussed.

(6) A case report of appendicitis in a femoral hernial sac, in a male, is included.

REFERENCES

- <sup>1</sup> Auchincloss, H.: Fascial Strip Repair of Femoral Hernia. *ANNALS OF SURGERY*, **81**, 1009, 1925.
- <sup>2</sup> Carscadden, W. G.: Aponeurotic Suture Repair of Femoral Hernia. *Canad. M. A. J.*, **30**, 598-601, June, 1934.
- <sup>3</sup> Dickson, A. R.: Femoral Hernia. *Surg., Gynec. and Obstet.*, **63**, 665-669, November, 1936.
- <sup>4</sup> Doolin, Wm.: Inflamed Appendix in a Hernial Sac. *Brit. Med. Jour.*, **2**, 239, 1919.
- <sup>5</sup> Fallis, L. S.: Inguinal Hernia; A Report of 1,600 Operations. *ANNALS OF SURGERY*, **104**, 403-418, September, 1936.
- <sup>6</sup> *Idem*: Direct Inguinal Hernia. *ANNALS OF SURGERY*, **107**, 572-581, April, 1938.
- <sup>7</sup> Fowler, R. H.: Inguinal Hernia of the Cecum and Appendix. *Am. Jour. Surg.*, **27**, 26, 1913.
- <sup>8</sup> Lotheissen, G.: *Zentralbl. f. Chir.*, **25**, 548-550, 1898.
- <sup>9</sup> Mikuli, N. F.: Discussion on the Radical Operations for Inguinal and Femoral Hernia and Their End Results. *Int. Abst. Surg.*, **48**, 322, 1929.
- <sup>10</sup> Moschowitz, A. V.: Femoral Hernia: A New Operation. *N. Y. State J. Med.*, 396, October, 1907.
- <sup>11</sup> Payne, R. L.: Femoral Hernia: Operative Repair by Living Fascial Sutures. *J.A.M.A.*, **104**, 276-278, January 26, 1935.
- <sup>12</sup> Seelig, M. G., and Tuholske, Lester: Femoral Hernia: The Inguinal Route Operation. *Surg., Gynec. and Obstet.*, **18**, 55-62, 1914.
- <sup>13</sup> Watson, L. F.: *Hernia*. St. Louis, C. B. Mosby Co., 1924.

DISCUSSION.—DR. R. A. GRISWOLD (Louisville, Ky.): In this very excellent presentation of Doctor McClure's, several important things have been brought out. One was his advice to make a routine exploration of the femoral sac. That was brought to my attention in the case of a female missionary, who came to us, after operation elsewhere, for a right inguinal hernia. I examined the inguinal region and there was slight weakness, but hardly enough to cause the symptoms of which she complained. Because of her insistence, I agreed to reoperate. On getting up at the end of two weeks, however, she said the hernia had returned, and I put her down as a neurotic. Several weeks later, on reexamination, I found a slight impulse over the femoral opening. I operated again and found a small femoral hernia. Since this was repaired, three years ago, she has carried on without symptoms. Since that time, I have routinely tried to put my finger into the femoral canal.

I should like also to emphasize the good points of the inguinal approach, especially when we may have to perform a resection or other procedure on the bowel, for obstruction.

DR. J. W. PRICE, JR. (Louisville, Ky.): Doctor McClure's statistics are very interesting, and the reason I am speaking is because I think his statistics and mine bear some relation. He reported 90 cases among 240,000 admissions. I wish to report three in about one-twentieth that number of admissions. The first femoral hernia I had to operate upon occurred in a patient who was prepared for operation for a fibroid of the uterus, and we found a femoral hernia and promptly dealt with it through the midline incision which we had made. The second patient, age 78, had an incarcerated femoral hernia. We split Poupart's ligament and made a longitudinal incision; the patient made a complete recovery. I should never hesitate to divide Poupart's ligament. Our third patient, age 73, we operated upon under local anesthesia also. It was not necessary to divide Poupart's ligament, but we dealt with the hernia from above. These two elderly patients were not very active anyhow, but they are, so far as I know, getting along well with no recurrence.

DR. HAROLD H. RUTLEDGE (Richmond, Ky.): Because Doctor Coley, who was planning to discuss this paper, had to return to New York, as his substitute I should like to report on 314 consecutive operations for femoral herniae performed at the Hospital for Ruptured and Crippled, during the period from 1925 to 1936. During the past three years the silk technic has been used in all these operations. In 30 consecutive cases there were no deaths, and only one infection; there were two recurrences. This group should be compared with another of 260 cases in which catgut was used. In 60 followed cases in this second group, there were three deaths and seven, or 2.7 per cent, infections; furthermore, there were four recurrences.

Fascial sutures were used freely in the period from 1925 to 1935, especially for large femoral herniae and for recurrent herniae. In 24 such cases in our series, there were two deaths and four infections.

So far as the approach is concerned, we prefer the low for all small primary herniae with narrow femoral canals, and the high or inguinal approach for all recurrent or epigastric or incarcerated herniae or where the orifice is wide. Under these latter conditions, the advantages of approximating Poupart's ligament to Cowper's ligament, and obliterating the opening high up, seem self evident.

DR. ROY D. McCLURE (Detroit, Mich., in closing): I would say that the recurrence rate of 7.4 per cent is simply due to the fact that our follow-up has been poor. This, in turn, is due to the fact that our series of cases represents our entire work during the past 23 years with this type of hernia, and it is difficult to recall one after two decades. It is remarkable, however, when one really gets interested in a subject, how the follow-up improves. The most recent patients of this series have been followed for only six months. Doctor Fallis and I feel that our rate of recurrence would be more likely around 11 per cent, as others have reported, had our follow-up been perfect.

I would refer those of you who are interested in the subject of appendicitis in a hernial sac to an excellent article by C. P. G. Wakeley, *Lancet*, 2, 1282-1284, December 3, 1938.