and probably the necrosis existing at operation, had several hours.

**Summary**

(1) A case of Torsion of the Abdominal Cord is reported.

(2) The important features are summarized in the literature, the issue will be cleared for the future.

**TORSION OF INTRA-ABDOMINAL TORSION**


(2) Atlee: Lancet, 1911, ii, 718.


**MENSTRUATING TRACT FROM UTERUS TO ANTERIOR ABDOMINAL WALL**

**REPORT OF A CASE**

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Reports of fifty-two cases of endometrioma of the postoperative abdominal scar have been reviewed.** Apparently the largest number available in previous reviews has been forty-six. Attention is called to the meager notice which has been paid in the past to the possibility of the development of these growths by direct invasion of endometrium into the abdominal wall. It has not been denied that this may occur, but for the most part it has been considered only the remote possibility, and in many instances the most obvious distortions of logic have been indulged in to avoid falling upon this quite adequate and apparent explanation. The fact, as Nicholson says, that "anatomic continuity between the epithelium of uterine mucous membrane and that of the tumor has not been established in one single case," has been thought sufficient by the majority to exclude such a possibility.

The case to be reported in this paper furnishes a rather perfect example of such continuity. Other instances will be noted, in which the inference of a similar etiology is virtually unassailable. In the face of such direct evidence, and in view of other factors noted from a study of the available cases in the literature, the issue will be cleared for the recognition of this mechanism as the basis of the formation of these growths in a large number of the reported cases. Thus a more intelligent approach can be made to the prophylaxis of the condition.

**CASE REPORT**

The patient is 24 years of age and married. She has had one miscarriage and one normal delivery. Six years ago, following a gonorrheal infection, she was operated upon at Multnomah County Hospital. The operation lasted three hours. The operative report states that there was performed "bilateral salpingectomy, left oophorectomy, resection of fundus of uterus to just below where tubes come off, removal of cone shaped piece from endometrium." Three drains were inserted into the cul de sac.

The patient was discharged twenty-four days after operation. The old scar with endometrial new growth at lower pole is now shown, with the incision made at recent operation. Detail of new growth is shown in inset. Bleeding occurred by rupture of the blebs at the meninges.

**Above the symphysis, there is a wrinkled depressed area, reddened and puckered, and about the size of a five cent piece (fig. 1). Its depressions are filled with what appears to be old dried blood. A sanitary napkin, the upper end of which overlies this area, is quite profusely blood-stained. The tender region as well as from the vagina. The flow is frequently quite profuse but always dark in color. The tenderness and pain at the mesentery is described as excruciating.

Abdominal examination (second day of menstrual period) revealed a rather distorted middle scar from sympathetitis to umbilicus. The condition of the scar is suggestive of previous incisional infection. At the lower pole, immediately above the symphysis, there is a wrinkled depressed area, reddened and puckered, and about the size of a five cent piece (fig. 2). Its depressions are filled with what appears to be old dried blood. A sanitary napkin, the upper end of which overlies this area, is quite profusely blood-stained.
Fig. 2. Schema of author's case. The endometrial tract was traced by sections and reconstructed as shown. It was visible to the naked eye on gross section.

sections of blocks, cut so as to include the skin and the attached cord beneath it, reveal an intimate connection between the smooth muscle which makes up the body of the cord and the cutaneous layer. The two tissues blend intimately, yet are distinctly differentiated from each other. Scattered here and there in the smooth muscle are glands identical, but the general arrangement throughout is that of a small but perfectly ordered endometrial cavity. It is interesting to note also that the condition of this miniature endometrium corresponds roughly to the late stage of regeneration which agrees with the patient's actual menstrual phase.

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COMMENT ON ETIOLOGY

The rational explanation of the condition noted here is quite obvious. The presence of drains together with the tendency to wall off of the drained tract and the occurrence of infection, involving the incision on the top of the corpus as well as the deeper layers of the abdominal incision, are all factors tending to cause fibrous adhesion of the adjacent wound and infected surfaces.

With the subsequent establishment of fibrous tissue, and the breaking down of the stitches in the uterine wall due to infection, it is quite simple to picture the formation of a sinus tract which eventually became carpeted with outgrowing endometrial mucosa.

Macroscopic examination: Sections from various parts of the above-described cord-like structure show that its lumen is surrounded by a well composed of smooth muscle bundles with a small amount of connective tissue, carring blood vessels, etc. The epithelial lining of the lumen consists of a single layer of tall columnar epithelial cells. There is a clearly defined characteristic stroma, in which appear many simple glandular structures lined by a tall columnar epithelium. Cilia were not noted.

It is my observation, and that of Dr. Warren Hunter, that the muscular wall bears a great similarity to the myometrium, while the lining unquestionably bears the exact structure of the endometrium. Not only are the composite histologic structures identical, but the general arrangement throughout is that of a small but perfectly ordered endometrial cavity. It is interesting to note also that the condition of this miniature endometrium corresponds roughly to the late stage of regeneration which agrees with the patient's actual menstrual phase.
reasonable to accept, as do the authors, the highly probable hypothesis that there existed for three months an actual fistula which allowed the escape of menstrual blood from the fundus. Subsequent atrophy and occlusion of the connecting portion caused occlusion and obliteration of the sinus.

Later the menstrual function was assumed by the growing endometrial elements in the better protected layers of the abdominal wall. Such a sequence seems reasonable, especially when we have evidence of the atrophy of a similar connecting tract in several cases, notably that of Fraas, in which tubules and cysts were demonstrated in the adhesions connecting the fundus to the abdominal wall growth.

As an alternative explanation, certain authors (Nicholson, Novak, et al.) have maintained that this phenomenon is due to a metaplasia of the peritoneal epithelium in the region of the scar, this phenomenon is due to a metaplasia of the peritoneal aspect of the scar, subjacent to the endometrial lining. Such a peritoneal metaplasia in its general application, but particularly in the past ten years) a relatively infrequent occurrence following operations on the adnexae, it is not difficult to picture an actual invasion through the agency of adhesions, especially where a cornual excision of a tube has been done. For example, in one of the reported cases the uterine cornu, from which the tube had been excised, was found adherent to the peritoneal aspect of the scar, subjacent to the endometrium. Out of eight cases (15.4 per cent), following operations upon the adnexae, the fundus was adherent to the scar in three, not described in three and not adherent in two.

Where there is no adhesion or evidence of past adhesion via which invasion may have occurred, some other hypothesis must obviously be adduced. For example, two cases are noted following simple tubal sterilization, and others following operations involving only the uterine ligaments. Barring the possibility of infection (which is not always clearly eliminated), it would require a considerable distortion of the direct invasion theory to fit such conditions. It would perhaps be less out of the drawing to fall back on Sampson’s theory and suppose that endometrial fragments from the invaded fundus or tubal regurgitation (due to manipulation) may have become viable in the edges of the incision.

Space does not permit a careful analysis of the interesting aspects presented by even so brief a tabulation of the published cases as that in the chart. I will, however, call your attention to a few outstanding factors. Ventrosuspension, which is a relatively very infrequent operation, carries the largest incidence of postoperative endometrioma following operations on the adnexae, it is not difficult to picture an actual invasion through the agency of adhesions, especially where a cornual excision of a tube has been done. For example, in one of the reported cases the uterine cornu, from which the tube had been excised, was found adherent to the peritoneal aspect of the scar, subjacent to the endometrium. Out of eight cases (15.4 per cent), following operations upon the adnexae, the fundus was adherent to the scar in three, not described in three and not adherent in two.

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cision of parts of the corpus uteri resulting in adhesion to the anterior abdominal wall. In only two instances was a simple uncomplicated surgical procedure upon the adnexae alone followed by such a condition. Cesarean section is next in frequency of operations involving opening of the pelvic organs. It is suggested that there is an attenuation of the regenerative potentiality of the decidua at term which is responsible for the low incidence noted.

In sharp contrast to this figure is that which note for operations involving opening of the pregnant uterus in the first two trimesters. This is a very unusual procedure indeed, yet it carries a percentage incidence scarcely lower than that of section at term. It seems that there should be a heightened growth potentiality of this early decidua over that at term. This, of course, is mere speculation. I am not aware of animal experiments which might clarify the question.

TREATMENT

The treatment of this condition in all of the reported cases has been surgical excision. No recurrences have been noted, and the surgical treatment may be considered satisfactory. General considerations in regard to prophylaxis would indicate the desirability of carefully covering the exposed wound edges in all laparotomies, but especially where the endometrial cavity is being invaded. The operation of ventrosuspension of the corpus uteri should be undertaken with even more than the usual circumspection. Some modification of the older type of operation, which would include complete excision of the endometrial mucosa, might entail less likelihood of later endometrial formation. Undue tension on sutures should be avoided. The use of drains should be limited to imperative indications. They are not indicated in operations involving ordinary infections of the adnexae.

SUMMARY

It has been argued that endometrioma of the laparotomy scar does not occur as the result of direct invasion of the abdominal wall by uterine mucosa. The chief argument against this occurrence has been that direct continuity between the epithelium of the uterine cavity and that of the new growth has never been established.

A case is reported (author's) in which such continuity is definitely established and other cases, apparently not generally noted are referred to (Loicq, Pucconi, Ballin). Another case is quoted (Roeder's), in which the evidence is clearly to the effect that migration occurred along silk sutures from the endometrium to the abdominal wall. In a third case (Gouillaud's) there was apparently at first a definite sinus from the uterus to the skin, with later closure of the deeper part of the tract and still later assumption of the menstrual function by the more superficial elements, remaining viable in the abdominal wall. A fourth case (Fraas') completes the sequence indicated by the others by the finding of endometrial tubules and cysts in the abdominal wall.

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Fig. 3. Cut from Class I of Ballin's report. Note passage of vessel into fundus. Postoperative menorrhagia. Direct communication of the uterus through the endometrial enclosure into the uterine cavity. Also note the intestinal adhesions to the enclosure.