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ENDOMETRIAL TUMORS IN ABDOMINAL SCARS *

MARION DOUGLASS, M.D.
CLEVELAND

The occurrence of tumors resembling endometrial tissue in abdominal wounds has been reported infrequently. It is in these cases which appear to be the result of "seed implantation" of endometrial cells that the theory of direct transtubal dissemination of endometrium-like tumors throughout the pelvis has one of its strongest proofs.

The work of Sampson on the etiology of heterotopic endometrial tumors has brought forward many questions of fundamental importance. Acceptance of the transtubal dissemination theory has been general but recently objections have been raised (Novak, Ewing) which would seem to point out that tubal dissemination and implantation may account for only a relatively small percentage of the endometrial lesions of the female

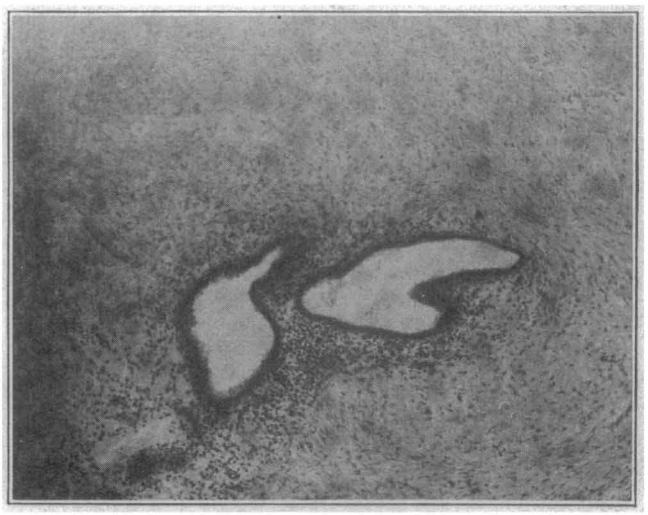

Fig. 1 (case 1).—Section showing gland spaces containing blood. There was evidence of response to menstrual stimuli. The patient gave a definite history of increase in the size of the tumor and also of pain at menstrual periods. Through and through fixation of the uterus with silkworm-gut sutures was performed eight years before admission. The conclusion that direct implantation was the cause of the tumor is almost inescapable in this instance. Slightly reduced from a photomicrograph with a magnification of 100.

pelvis. These lesions occur in abdominal wounds. Heaney [1] reported two cases and reviewed seven others following operative procedures on the pregnant uterus. In all, twenty-nine cases have been reported, and in several cases the uterus was not interfered with in the course of the operation. It is, however, a most disquieting thought to the surgeon who plans a myomectomy, salpingectomy, ventrosuspension or fixation of the uterus to feel that he may be responsible for the development of a neoplastic lesion which may require even a laparotomy for its cure.

The etiology of periodically painful adenomas in abdominal scars following cesarean section seems very clear on the basis of direct implantation of endometrial cells, and the remarkable thing is the extreme rarity with which such lesions have occurred. It is probably quite impossible to protect the wound edges and cer-

* From the Department of Gynecology, Western Reserve University School of Medicine, and the Lakeside Hospital.

1. Heaney, N. S.: Adenomas of Endometrial Origin in the Laparotomy Scar Following Incision of the Pregnant Uterus, Am. J. Obst. & Gynec. **10**: 625 (Nov.) 1925.

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tainly the peritoneal surface from contamination by pieces of endometrium when the uterus is open, yet only in the lowest possible percentage of cases does adenomatous implantation occur in the wounds. Ventral fixation of the uterus, when the opportunity for successful transplantation is much less favorable, has

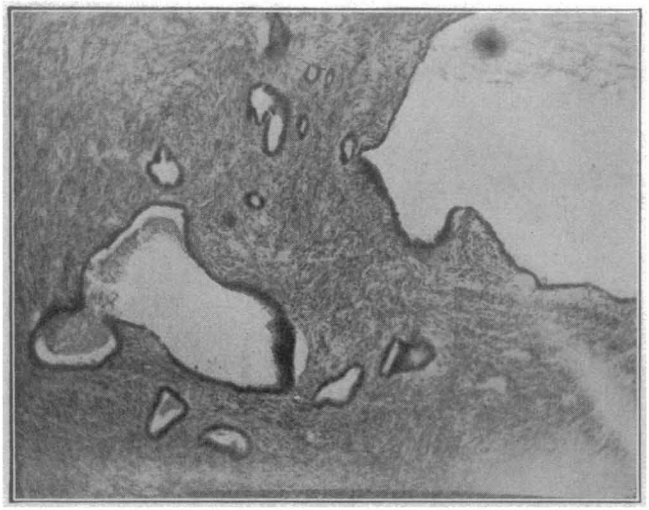

Fig. 2 (case 2).—Section showing bizarre glandlike spaces with little or no stroma. The uterus contained typical resting endometrium. The gland size and stroma variation was marked. Slightly reduced from a photomicrograph with a magnification of 100.

contributed most of the cases, the cells probably being carried on the needle and suture (Judd).

This suggests the thought that the capacity for growth in a new environment is of relatively low grade in the endometrium during pregnancy, while on the other hand growth occurs in scars under infinitely less "exposure" when the implanted cells are from nonpregnant endometrium. Novak has stated that tissue culture growth of "menstruating" endometrium is extremely

Fig. 3 (case 3).—Section showing glands containing blood in fairly abundant stroma. The last menstrual period began ten days before. Slightly reduced from a photomicrograph with a magnification of 100.

difficult if not impossible to obtain and it is safe to assume that, granting the fact that implantation endometriosis does occur, some other factor prevents implantation from being operative when the uterus is opened at cesarean section. In the series of "adenomyomas" of the abdominal wall reported from the Mayo Clinic,[2] six cases followed suspension operations and in none was the uterus disturbed during pregnancy. I am here presenting three cases showing typical endometrial lesions in abdominal scars.

REPORT OF CASES

CASE 1.—A white woman, aged 41, entered the hospital complaining of pain on defecation and pain in the lower part of the abdomen at the site of a former operative scar. This pain was much exacerbated just preceding and during the first day of catamenia.

She had had an appendectomy eleven years before, followed by peritonitis for which drainage was instituted. About eight years before she had had a fixation of the uterus, which was done with through and through silkworm-gut sutures. For several years she had noticed a lump in the lower portion of the suprapubic scar, which enlarged just previous to the menstrual period and became very sore.

Just at the bottom of the suprapubic scar was a nodule 2 by 1 cm., composed grossly of fibrous tissue with small glistening hemorrhagic areas.

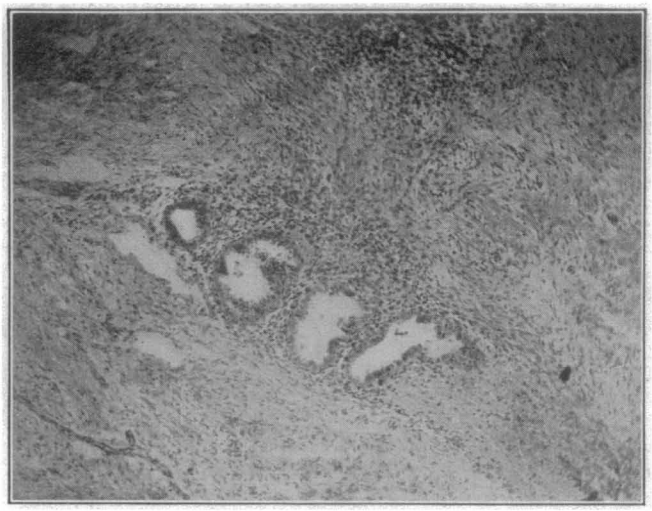

Fig. 4 (case 3).—Section showing glands with ingrowths. There was definite evidence of a "premenstrual" hyperplasia of the glands and the stroma was not so well developed. Slightly reduced from a photomicrograph with a magnification of 100.

Histologic examination showed that in a stroma of rather dense fibrous tissue with numerous areas of glands with a varying amount of regular stroma there were large glands containing blood lined with medium columnar epithelium. There was slight evidence of menstrual reaction with subepithelial infiltration of blood in several places in various glands. This case may be considered one of direct implantation, as there was a history of direct passage of silkworm-gut pieces through the wall (fig. 1).

CASE 2.—A colored woman, aged 20, entered the hospital, Sept. 6, 1927, complaining of pain in the left lower quadrant and above a midline incision scar, and of a palpable lump in the incision. A laparotomy had been done two years before for inflammatory disease, with salpingectomy and suspension of the uterus. A year and a half before, an abscess had been opened and drained in the immediate vicinity of the present mass. Since that time the patient had had very poor health, and for about one year she had had pain in the incision.

Pelvic examination revealed a marital outlet. The cervix was in good condition. The fundus was adherent to the anterior abdominal wall and there was a mass in the left side.

Laparotomy disclosed multiple adhesions and a large follicular cyst of the left ovary. Excision of the scar showed many areas containing dark brown coagulated fluid suggesting blood-containing cysts. The scar tissue was excised. Supra-

2. Lemon, W. S., and Mahle, A. E.: Ectopic Adenomyoma: Postoperative Invasions of the Abdominal Wall, Arch. Surg. **10**: 150 (Jan.) 1925. Mahle, A. E., and MacCarty, W. C.: Ectopic Adenomyoma of Uterine Type, J. Lab. & Clin. Med. **5**: 218 (Jan.) 1920.

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vaginal hysterectomy and left oophorectomy were performed. Microscopic section at the time of the drainage of the abscess showed chronic granulation tissue. At operation the scar showed fibrous connective tissue containing small cavities filled with dark material.

Microscopic examination of the section showed a relatively small amount of stroma surrounding glands of rather bizarre

Fig. 5 (case 3).—Section showing slighter stroma development and no evidence of menstrual activity. Slightly reduced from a photomicrograph with a magnification of 100.

type, being composed of extremely low columnar epithelium, and varying tremendously in size. In other places there was a small amount of periglandular stroma. In a very few glands there was blood, many of the others not showing any evidence of menstrual rhythm. Figure 2 shows absence of periglandular stroma and diversity in gland size.

CASE 3.—In a patient entering the hospital, Sept. 4, 1927, a lump in the subcutaneous tissue near the upper end of a midline scar between the symphysis and the umbilicus had been noticed in May, about six months after a therapeutic abortion, which was performed as a miniature cesarean section, the uterus being emptied through a median anterior incision. This was about 1 by ½ inch, and tenderness was marked preceding and during menstrual periods.

The tumor was excised and removed with the fascia to which it was adherent. A specimen consisted of a bluish red ovoid polypoid mass of rubbery consistency, resting on a white fibrous tissue base. A section showed supporting strands of tissue radiating from the base, and the surface had a cauliflower-like appearance.

A section of the tumor taken from the operative scar consisted largely of fibrous connective tissue in which a number of glandular acini were seen lined with columnar epithelium. These acini occurred singly and in groups and were of varying size and shape, resembling, however, endometrial glands. Immediately surrounding these groups was, in most instances, typical endometrial stroma. The glands themselves were empty, excepting a few which contained a small number of red blood cells. The fibrous connective tissue stroma showed a diffuse area of hematogenous pigmentation. Other sections showed striated muscle and adipose tissue adjacent to the tumor mass. A diagnosis was made of endometrial transplant.

The gross tumor showed areas of blood which proved on histologic examination to be glands containing blood. Microscopically there were many areas showing subepithelial infiltration of blood. There were definite premenstrual changes apparent in certain of the glands (fig. 4), and yet in many glands in the same section (figs. 5 and 6) there was no marked evidence of menstrual reaction. The character of the glands varied from simple epithelial lined cavities in the tissue to complicated adenomatous structures which resembled endometrium exactly with characteristic stroma. Curettings from the uterus were of premenstrual type.

COMMENT

This case satisfies all the criteria of direct implantation. The uterus was opened directly and there was painful enlargement of the tumor at the menstrual periods. The same phenomenon has occurred when the abdomen was opened for other causes, however; viz., appendicitis. As Heaney points out, it is remarkable that it does not occur more frequently after cesarean section because the wound must always be contaminated with bits of mucosa. Yet it is of extreme infrequency.

The lesions appear months or years after the laparotomy, and the clinical history is fairly typical. The nodules swell and become tender at the time of menstruation and often appear as bluish blebs giving the appearance of an inflammatory swelling. Certain tumors have no relationship to the menstrual cycle but are uniformly tender at all times. Case 2 shows an atypical gland type with poor stroma development, and there was no history of menstrual tenderness in the tumor.

The cases in which these lesions occur after inflammatory processes in the abdomen in which the uterus was not opened do not admit of explanation as to etiology at present. Certainly no theory propounded at present explains them better than that of direct implantation of endometrial cells, if one will admit that there is a decreased tendency for endometrial cells from a pregnant uterus to grow successfully when deposited in a new environment. Neoplasms of endometrial origin are found only during the menacme, are controlled by irradiation either of roentgen ray or of radium sufficient to produce amenorrhea, and have been observed to regress fairly rapidly after bilateral oophorectomy. If careful bimanual examination does not reveal any other pelvic lesions suggestive of endometriomas, simple excision of the tumor may be deemed sufficient treatment for these lesions found in abdominal scars.

Fig. 6 (case 3).—In this portion of the tumor there was no evidence of stroma and there was only a simple cavity lined by low cuboidal cells surrounded by a dense fibrous stroma. This marked variation in the morphology of glands within the same tumor argues directly against the implantation origin of endometrial tumors, for mature endometrial cells may well be expected to produce a lesion more true to type even when implanted in alien soil. Slightly reduced from a photomicrograph with a magnification of 100.

SUMMARY

1. Endometriosis occurs in abdominal scars by direct transplantation of endometrial cells, which after a varying latent period form small tumors in this new habitat.

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2. The frequent occurrence of these lesions after uterine suspension or fixation of various types suggests the advisability of care in using traction sutures perforating the uterine wall as a method of elevating the uterus, and of protecting as thoroughly as possible the wound edges and peritoneal surfaces when the uterus is incised or punctured by instruments. Even salpingectomy with resection of a wedge of uterine muscle at the cornua may scatter viable endometrial cells which may become implants.

3. Implantation endometriosis in cesarean wound scars is remarkably rare and suggests lower viability and tendency toward growth in the endometrial cells during pregnancy than during the nonpregnant state.

1235 Lakeside Avenue.

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