in fat removed from the femoral canal, and in the subcutaneous fat in different situations in the body as well as in the breast. In a paper on xanthema and xanthosis⁸ he writes:

"When adipose tissue is involved in a subacute inflammatory process it is not uncommon for aggregations of large, foamy endothelial cells to make their appearance in the interstices of the tissue between the oil droplets. Like foamy cells elsewhere, they are filled with cholesterolin fat, and often they may be seen going on to the formation of foamy giant cells. Rarely pure cholesterolin crystallizes out, and a remarkable histological picture results, in which foamy cells, giant cells, cholesterolin clefts, and foci of necrosis are mixed up together. Similar changes may be met with in the quieter forms of fat necrosis."

That this condition is not so uncommon as supposed is also evidenced by a table published by Lee and Adair² in the article already referred to. During the period in which their five cases of fat necrosis occurred they found that, compared with primary breast cancer, the incidence was 1.8 per cent., with operable cases of breast cancer 4.2 per cent., and compared with benign lesions the incidence was 7 per cent.

The following case recently came under my care:

Clinical History of Case.

Mrs. E. A., aged 53, no children. Rather an obese subject. She knocked her right breast two months previously to noticing a lump therein. On examination, there was a nodule about 1½ by 1½ in. in the upper and outer quadrant of her right breast; it was hard and fairly well defined, and could be easily felt with the flat of the hand. The centre of the nodule was attached to the skin, but there was no deep fixity, nor could any enlarged glands be felt in the axilla. The nipple was not retracted, nor was the breast elevated. The diagnosis of early carcinoma of the breast was made, and with this diagnosis two of my colleagues agreed. A radical removal of the breast was carried out. The convalescence was straightforward, and the patient was discharged three weeks later with a soundly healed wound.

Microscopic Examination.

The breast lesion is a subacute inflammatory and necrotic one, without evidence of neoplastic change, and involving the adipose rather than the glandular tissue.

1. In the central portion of the affected area there are several small necrotic patches of irregular outline, as yet free from calcification.

2. Active fibroblastic proliferation is the chief feature of the central area. Intermingled therewith are fat-droplet spaces derived from the original adipose tissue, many of them being of large size from fusion of the contents of disintegrating fat cells. Scattered endothelial cells, lymphocytes, and "foamy" cells (fat- and lipid-filled phagocytes) are present in small numbers.

3. In the outer zone of the lesion the most notable feature is the accumulation of the same foamy macrophages in large numbers throughout the adipose tissue. They occur in irregular groups and strands, separating the adipose tissue cells from one another, and are associated with slight degrees of fibrosis. The examination of frozen sections shows that they contain both neutral and cholesterol fat, taken up by them from disintegrating fat cells, many of which have their oil vacuoles filled by the products of cell degradation.

4. A few giant cells with "foamy" cytoplasm and up to six or eight nuclei are present here and there throughout the lesion.

5. The scanty gland acini present appear to be involved secondarily in the inflammatory process.

The appearances correspond to those which have been described in America under "traumatic fat necrosis." The lesion differs from the fat necrosis of pancreatitis in being of slow evolution, so that phagocytosis of fat-cell disintegration products and fibroblastic proliferation keep pace with cell destruction. The axillary glands show no pathological changes. The condition is met with in many different sites, but in the breast it is of special importance because of the danger of confounding it with scirrhus carcinoma.

The importance of traumatic fat necrosis from a clinical viewpoint lies in its simulation of carcinoma of the breast; in many of the published cases a radical operation has been carried out, and only later, on microscopic examination, has the true diagnosis been made. The recognition of the condition is therefore important and should be borne in mind, especially in what appears to be an early case of mammary cancer. In arriving at a diagnosis the traumatic nature of the lesion should be remembered, as injury seems to have been the starting point in most of the published cases. It is interesting to note, that in

three of the five cases of Lee and Adair² the disease developed after the giving of saline infusions into the breast. Although patients with carcinoma of the breast frequently state that they have had a knock or blow on the breast, or think the corset may have rubbed them, the exact nature and date of the injury is usually rather indefinite. In cases of fat necrosis, however, the exact trauma is clearly remembered.

The time interval between the injury and the development of the tumour varies from a week or two up to several years. The condition is usually met with during the fourth and fifth decade, and mostly in women with large and fat breasts. The tumour itself, although hard like a cancer, is better defined. The superficial fixity of the tumour to the skin exactly resembles that found in cancer, but deep fixity is not as a rule present. The axillary glands are not enlarged, though this does not help in the differential diagnosis from an early cancer. In a suspected case it will often be necessary to perform a local excision of the tumour for microscopic examination, since the mimicry of early mammary cancer is so close. If the condition is borne in mind, however, and only the lump removed, adequate treatment will have been carried out and an extensive operation obviated.

I am indebted to Professor M. J. Stewart for his advice in the preparation of this article, and for the report on the microscopic examination of the specimen in the case quoted.

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SEVERE HAEMORRHAGE FROM THE RUPTURE OF A CORPUS LUTEUM CYST.

BY

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HAEMORRHAGE into the peritoneal cavity from a ruptured ovarian cyst is met with occasionally. Haemorrhage from a ruptured luteal cyst in a young woman, simulating an ectopic pregnancy, is a rare condition. Edward Moore¹ reviewed the literature in 1922 and could find only fourteen cases recorded, a list of which is given in his paper. Since that time records of several patients suffering from this condition have been published, notably in Germany by Kaboth,² Hesselberg,³ Eick,⁴ Schickele,⁵ and others. But in the English⁶ and American literature little mention has been made of this condition. It has been my good fortune to have been associated with three cases, descriptions of which are given below. As a ruptured ectopic pregnancy is closely simulated, a pre-operative diagnosis is difficult, and in this series the condition was not diagnosed before operation, and afterwards only when portions of the tissue removed had been sectioned and examined microscopically. By careful attention to the history, however, it should be possible to make a diagnosis. The most important points in the history are as follows.

The patient is a young woman, usually single; the average age in the following cases was 24. There is a history of a sudden attack of severe abdominal pain localized to the lower abdomen on the right or left side, depending probably on the ovary affected; this is accompanied by nausea, and occasionally by vomiting. The pain gradually passes off, and subsequently, following some strain producing increased intra-abdominal tension such as straining at stool, the patient has a feeling of faintness or actually does faint. The menstrual history is normal; there is no missed period, and the catastrophe bears no relation to the menstrual flow. On examination the patient is pallid, and sometimes restless and dyspnoeic. The pulse, generally rapid, thin, and running, may be slow. I have seen severe intra-abdominal haemorrhage with a pulse of 76. The temperature is usually subnormal, unless a considerable interval of time has elapsed between the

rupture of the cyst and the examination, when it may be raised. The abdomen moves with respiration, but is tender, especially on palpation of the lower quadrants; there is no rigidity. Per rectum, no mass is palpable, and there is absence of tenderness. Such a syndrome suggests a diagnosis of haemorrhage from a ruptured luteal cyst. The two conditions with which confusion is liable to occur are acute appendicitis and a ruptured ectopic pregnancy. The absence of epigastric pain, vomiting, hypogastric pain, and leucocytosis, combined with a flaccid abdomen, should exclude the former disease, and the absence of the history of a missed period and uterine haemorrhage, although not invalidating a diagnosis of ectopic pregnancy, renders it less probable.

Although the diagnosis may often remain tentative, the treatment must always be the same: immediate laparo-

FIG. 1.—Section of ovary, natural size. Corpus luteum cyst shown with a mass of blood clot in its cavity.

tomy, accompanied if necessary by a blood transfusion, since as soon as the peritoneum has been incised large quantities of blood escape. The operative treatment will not be considered in detail, but one or two points are worthy of further consideration. The abdomen should be opened in the mid-line below the umbilicus, the ovaries felt for, and the cystic one delivered. Should the condition be recognized, oophorectomy is contraindicated and the treatment of choice is to pass a mattress suture through the cyst wall. The blood in the peritoneal cavity should not be mopped out, but should be left, as it is quickly absorbed without producing adhesions, and acts as a slowly given blood transfusion.⁶ The convalescence in the cases recorded below was speedy and uneventful. The recognition of this condition is important, and ovaries removed at operations for ectopic pregnancies should be subjected to careful microscopic investigation, especially if the virginity of the subject be called in question. Kaboth suggests that the presence of an ectopic ovum cannot be excluded unless serial sections of the tissue removed are cut and examined. This I do not think necessary; the large mass of blood surrounded by the crumpled yellow ring of luteal tissue forms an unmistakable picture macroscopically, and the histological appearances of a luteal cyst are characteristic and illustrated in Figure 2. It seems that trauma is a factor in causing rupture of the cyst and the consequent haemorrhage. There was a very definite history of this in two of the cases in the present series and also in many of those recorded in the literature. Another point worthy of emphasis is the absence of any definite relation to the menstrual cycle. The condition is more common than a perusal of the literature would lead one to suppose.

CASE I.

A single woman, aged 22, was admitted on March 4th, 1926, complaining of pain in the abdomen. At 9 o'clock that morning there had been an acute attack of abdominal pain localized to the lower abdomen, accompanied by nausea, but no vomiting. During the

afternoon the patient fainted while straining at stool. The catamenia were regular. The rupture occurred four days before the period was due.

On examination the temperature was 97.8°, pulse 128, respirations 26. The patient looked ill and was pallid. There was generalized tenderness over the lower abdomen, but rigidity and distension were absent. Per rectum no tenderness or tumour was felt.

Operation (5 p.m.).—On opening the peritoneal cavity two to three pints of blood escaped. The bleeding was found to come from the right ovary, which was removed. The abdomen was closed. The patient made an uninterrupted recovery.

Pathological report on the tissue removed: Ruptured luteal cyst in a very oedematous ovary. There is a comparatively large vein in the wall of the cyst which has probably given rise to the haemorrhage.

CASE II.

X, aged 31, was seen eighteen months ago. One afternoon, while straining at stool, the patient had a sudden attack of pain in the abdomen and collapsed. The menstrual history was irregular. The periods had been regular till five months before the date of illness, when there was a period of four months' amenorrhoea

FIG. 2.—Photomicrograph of section of ovary containing a corpus luteum cyst. Yellow ring of luteal tissue surrounding blood clot is demonstrated.

followed by a loss on January 1st, 1926. The rupture occurred the second week in February.

On examination the patient looked ill and was blanched, the abdomen was distended and tender; pulse 140.

Operation.—On opening the peritoneal cavity a very large quantity of blood escaped. The right ovary was thought to be the site of an ectopic pregnancy, and was removed. The abdomen was closed without mopping out any blood.

The convalescence was uninterrupted. One year after the operation the abdomen was opened again for acute appendicitis. There were no adhesions present.

Pathological report on tissue removed: A ruptured luteal cyst of the ovary with haemorrhage around.

CASE III.

A single woman, aged 24, was admitted on March 13th, 1927, complaining of pain in the side. About midday on March 11th the patient had an attack of pain in the lower abdomen. The pain became more severe, and on the following day was accompanied by vomiting. The catamenia were regular. The rupture occurred ten days before the day the period should have started.

On examination the pulse was 120, the temperature 100.2°, respirations 24. The patient was collapsed and waxy in appearance. The abdomen was tender all over, but especially in the iliac fossae; there was no rigidity. Per rectum there was tenderness, but no tumour could be felt.

Operation.—On opening the peritoneal cavity a large quantity of blood escaped. Some of the blood was sucked out with a suction pump, 29½ ounces being removed in this manner; about the same quantity was left in the abdomen. The left ovary was found to be bleeding and was removed. The patient made an uninterrupted recovery.

Pathological report on the tissue removed: A ruptured luteal cyst of the ovary with haemorrhage around.

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