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The term colloid carcinoma has been given to a type of cancer containing a large amount of colloid substance; it has been found in the pylorus, the stomach, intestines, peritoneum, mammary gland, the liver, the kidney and ovary, although the two latter organs are less frequently the seat of this pathological process.

The name of alveolar carcinoma has also been given to this type of neoplasm on account of its macroscopical appearance, but the old surgeons employed this term in every case to growths which presented a more or less gelatinous consistency, and it has only been in recent years that this type of tumor has been considered a carcinoma, which has arrived at the highest state of colloid metamorphosis.

The cause of colloid degeneration is probably to be explained from the fact that in every carcinoma which has attained a certain degree of development, a retrogressive metamorphosis takes place. For example, carcinoma of the mammary gland has a marked tendency to undergo fatty degeneration, while cancer arising in mucous membranes, covered with a cylindrical epithelium, will undergo a mucous metamorphosis.

That colloid carcinoma is more prone to arise in the stomach, intestines or peritoneum, is due simply to the physiological properties of the cell elements from which the neoplasm originates. Although Rindfleisch does not deny that a primary colloid metamorphosis can take place, he is, nevertheless, of the opinion that the principal part of the colloid change takes place in the beginning, at the boundary line of the connective tissue and epithelium.

According to this authority, if one examines the very characteristic picture of colloid carcinoma, and then if it be observed how the groups of carcinoma cells lying in alveoli were in the

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first place adherent to the walls of these alveoli, from which they are gradually separated by the formation of strata of colloid substance, without being either increased or decreased, and how, at length, they atrophy and disappear after numerous strata of colloid material have become deposited,—all this can only point to the fact that the greater amount of colloid substance is secreted at the boundary line of connective tissue and epithelium, although the fully developed epithelial cells are in no manner involved in the process.

A direct transudation from the blood can, of course, not be admitted, because the endosmotic power of colloid substance is nil. On the other hand, it may be that in these cases the colloid substance is a metamorphosed formative matter of the epithelial cells, like an albuminous body from which other types of carcinoma obtain an increase in the number of their cells.

Arnold's theory must here be considered. As is known, this authority believes that epithelial cells originate from an amorphous matter, and if this theory be correct, the accumulation of colloid substance can be easily explained as a simple collection of this amorphous formative substance. The concentric stratification of the colloid matter met with in these neoplasms, certainly indicates a periodicity in the process of secretion; the fatty and granular detritus, which composes a single layer, must probably be regarded as a secondary product of colloid formation.

An example of this interesting pathologic process not long since was under our care, the history of the case being briefly as follows: Mrs. Francis E., aged forty-nine years; menses began at the age of thirteen and were always regular every four weeks, the duration being about four days, until about a year ago, when they became irregular, occurring every six or seven weeks. The amount lost at each menstruation since this function had become irregular had been very considerably increased, almost to the extent of a hemorrhage. For three months before coming under observation the patient suffered from a rather constant, dull pain in the pelvis and a burning sensation in the region of the umbilicus. At the age of twenty-seven the patient gave birth to a healthy child at term, and has never been pregnant since. The appetite was poor, the tongue clean, and the bowels fairly regular. Sleep was somewhat disturbed, but the patient did not complain of headache. The inguinal glands on both sides were found en-

larged and hard, but they were not tender to pressure; there was no enlargement of the supraclavicular glands. Lungs and heart apparently normal. Analysis of the urine negative.

By examination the abdomen was found somewhat enlarged and a number of dilated subcutaneous veins were visible in its lower half. There was a slight edema of the left leg. By palpation a globular mass was found situated in the left side of the abdomen and extending from the corresponding iliac fossa to within about six centimetres of the umbilicus, while there appeared to be a narrow strip of percussion dullness extending from the mass over the lower part of the abdomen to the right iliac fossa.

The vagina was roomy; bilateral laceration of the cervix. uterus was antiverted and apparently pushed forward by the mass Bimanual palpation revealed a fullness in Douglass cul-de-sac; the which was behind and to the left of the organ. The mass moved with the uterus, but could not be distinctly limited from it.

An exploratory laparotomy being advised and accepted, an incision about five centimetres long was made in the median line. As soon as the peritoneum was opened about 500 cc. of colloid substance escaped from the abdominal cavity. Introducing three fingers into the incision, the following condition of affairs was discovered: The left ovary was the seat of a large colloid carcinoma about the size of an adult head, while the peritoneum of the pelvis was studded with small clusters of secondary nodules extending across to the right iliac fossa, and it was to the latter that was due the dullness on percussion.

As it was more than useless to try to remove the growth, the abdominal incision was closed by several through and through wire sutures. The patient made an uninterrupted recovery, and was discharged in three weeks.

Microscopical examination of the colloid matter, which was discharged through the incision when the peritoneum was opened, showed numerous spindle and polygonal shaped epithelial cells which were imbedded in a colloid stratum.

The patient survived the operation seven weeks, and at her death permission was obtained to open the abdomen. The autopsy revealed a fibrinous peritonitis with secondary foci of colloid carcinoma, the left ovary being the starting point of the malignant process.

The origin of colloid carcinoma of the ovary is obscure, and many authorities are of the opinion that the process develops in a preëxisting ovarian cyst, and Rokitanski and Frerichs have particularly insisted on the external similarity of colloid carcinoma and certain varieties of cystoma of the ovary. Cruveilhier and Rokitanski believed that this form of malignant transformation was most prone to arise in parvilocular types of ovarian cystoma, while Frerichs and Virchow do not admit this theory. The former even went so far as to exclude colloid carcinoma from the genus of cancer and placed it in the list of cystic neoplasms having a colloid contents.

According to Waldeyer, it is quite possible to make a sharp distinction between colloid carcinoma and cystoma. An alveolar carcinoma is simply a type of carcinoma which forms a transition to cystoma, thus making, so to speak, a connecting link between the two, and is quite as justifiable, as for example—myxosarcoma, for they cannot be entirely separated from carcinoma or cystoma. This form of transition is not even necessary, inasmuch as a true medulary sarcoma can be found in cystic formations. It is useless to dispute the point whether or not the cystoma belongs strictly to colloid carcinoma, or vice versa.

There are clearly typical types which can only be described as true colloid cancers, and others which we have to admit belong to the class of cystoma; and there are atypic forms which show the most varied conditions of transition. Waldeyer also says that if in its development an epithelial tumor shows a tendency to cystic formation, and if the single cysts coalesce so as to form larger cavities, and if this occurs throughout the entire neoplasm without in any way affecting the neighboring tissues, the application of the term cystoma is justifiable; while for those tumors where in spite of the colloid changes taking place in their cellular elements and never forming larger cysts with special walls, with proliferating cell masses, and finally an extension of the tumor into the lymphatics and an invasion of the neighboring tissues, these should be called colloid cancer.

If, on the other hand, the authorities who assert that colloid carcinoma is simply a carcinoma in its highest development are correct, then surely certain points must be considered which would also be in favor of a point or origin of this form of carcinoma in the ovary. Provided that we maintain the theory of an

epithelial origin of ovarian cancer, the development of colloid carcinoma in this organ can then be traced back to the epithelial elements contained within it, although there can be no positive proof as to whether ovarian carcinomata are developed from the remains of Pfluger's tubes, or from Graf's follicles, or from the primary epithelial masses.

Rindfleisch is the only modern authority who gives an opinion as to the origin of carcinoma of the ovary. He admits the possibility that it originates from the follicles, or from the sites of the follicles; but, on the other hand, he believes that the endothelium of the lymphatics may undergo cancerous transformation. For the present, at any rate, the genesis of carcinoma of the ovary must be looked upon as still unexplained.

Regarding the character of colloid carcinoma of the ovary, it may be said that it can be either benign or malignant. Birch-Hirschfeld explains the benign character inasmuch as he says that the extensive metamorphosis of the cells hinders the intensity of their proliferative power, and that consequently a slower course and a relatively lesser inclination for metastasis is present; but in this case, we must admit that the carcinomatous cells have undergone a colloid metamorphosis and have lost their vitality, and that when they are carried to other parts of the economy, by either the blood or the lymphatic vessels, they do not form metastasis, and consequently cannot give rise to other foci of new formation.

But there are a good many cases which show that this theory is not correct, at least in every subject, because there is great malignancy which has been shown to exist, proven by the formation of multiple metastases. For this reason, Foerster contests the benign character of colloid carcinoma, and asserts that alveolar carcinoma of the ovaries always is accompanied by alveolar carcinoma in other organs of the body, and he thus, consequently, denies the possibilities of a primary colloid carcinoma. It has been also observed that colloid carcinoma is found in other organs when it exists in the ovaries; but the secondary foci are not, correctly speaking, a metastasis, but are more properly a direct extension of the growth, and therefore the neoplasm generally remains confined to the organs in its immediate neighborhood. Such an extension would naturally take place more especially along the tubes towards the uterus.

If we now consider the question of the age of patients who are

affected with colloid carcinoma of the ovaries, it will be seen that it has little of importance in a certain sense, for it has been shown that carcinoma of the ovaries attacks young people during, or even before, puberty, while in most all other viscera cancer is usually met with at a more advanced age, particularly at about the time of the menapause. Leopold mentions a case of a girl, aged twelve and a half years old, who had a cancer of one ovary weighing four pounds and a half, and Winkel and Olshausen, from their experience, believe that puberty and immediately after it is a very propitious time for the development of carcinomatous transformation in the female genital glands. It must not be understood that colloid cancer of the ovary cannot also arise in older persons, and this is shown by the case here related as well as many other recorded cases, all of whom were women who were at or had passed the menopause. This latter fact as well as the fact that young people are not exempt from colloid cancer of the ovary would allow the conclusion that this affection is independent of the age of the patient.

If we consider the character of the menses in subjects afflicted with this form of carcinoma we will note that there is in the first place an irregularity with long intervals and considerable loss of blood at the time; clots may also be present. This characteristic which is at variance with the general rule, as well as the entire absence of menstruation and other anomalies of this function, would naturally not allow one to make a diagnosis of a malignant tumor of the ovary, and we should never lay too much importance on the menstrual function when making a diagnosis of ovarian diseases, because Leopold found that in sixty cases of ovarian tumors the menstruation showed quite a varying conduct under similar pathologic conditions, and it has also been well demonstrated by Olshausen that it is only by a complete absence of the menses that we have one of the earliest signs of an ovarian neoplasm.

The commencement of a colloid cancer of the ovary is never indicated by any definite symptoms and must therefore be classed among the so-called latent neoplasms. The first symptoms complained of usually are burning pains in the region of the sacrum and in the abdomen. To this will soon be added a sensation of weight and an unpleasant tension in the abdomen. As soon as the tumor has reached a certain stage its growth then becomes rapid, a circumstance which generally first calls the patient's attention to

her trouble and causes her to seek medical advice. These phenomena are not characteristic in every case, for occasionally only moderate pains exist or may be even wanting while the rapidity of growth of the tumor will naturally vary in each case.

An important symptom is the appearance of ascites which can easily be demonstrated by percussion dullness as well as by the change of the dullness when the position of the patient is changed, and in the large majority of cases it is present in a more or less considerable degree. Ascites is usually looked upon as a phenomenon indicating pressure because the vessels of the abdomen and pelvis are compressed by the increasing size of the tumor; it also may be due to a peritonitis, which in its turn, may be produced by the affected ovary as well as to the relation between the latter and the peritoneum covering it. The pains may also be attributed to an irritation of the peritoneum.

Ascites, which is present in malignant ovarian tumors, is not infrequently accompanied by an edema of the lower extremities; this latter symptom may be explained by pressure of the tumor on the pelvic vessels, and Olshausen believes that it is also produced by the compression of the veins by infiltrated lumbar glands.

The presence of matastases in other organs is naturally of considerable diagnostic value, but is characteristic of carcinoma in general. The lymphatic glands are more especially affected, above all those that are in the immediate region of the neoplasm. In carcinoma of the ovary the glands of the inguinal region appear to be very frequently involved, and I may add that as in the case of malignant tumor of the testicle in the male, the ovary, when the seat of a malignant transformation, may also give rise to a secondary deposit in the supraclavicular glands.

When once the lymphatic system has become affected the road is open for the transportation of the malignant germs to more remote parts of the body.

As to the physical characters of colloid cancer of the ovary it may be said that in those cases where the ascites does not interfere with abdominal palpation, the tumor either was found to be fluctuating or else presented an uneven nodular surface.

The progress of colloid cancer of the ovary may naturally be surmised by what has already been said and an unfavorable prognosis is always to be given. If the progress of the growth is slow

and gradual it may be present for a considerable length of time before irritation of the peritoneum and the resulting ascites take place, and in these cases the patients are free from pain and feel fairly well. In the case of rapidly growing tumors the effect is very disastrous on account of the peritonitis and ascites as well as the emaciation and early cachexia.

The diagnosis of colloid cancer of the ovary is, to say the least, very difficult, and in most cases is practically impossible, but we will rapidly review the symptoms of a malignant tumor of the ovary in general. These symptoms are ascites, metastases in the peritoneum, omentum or in Douglas cul-de-sac that may sometimes be made out by a careful abdominal palpation and the presence of enlarged inguinal glands; the rapid growth of the tumor, the abdominal pains, œdema of the lower extremities, emaciation and cachexia.

The above mentioned symptoms would naturally lead the surgeon to make a diagnosis of malignant tumor, and if we compare these symptoms with those present in a carcinoma, sarcoma or cystoma of the ovary we will find that the symptomatology is practically the same. In making a differential diagnosis between carcinoma and sarcoma of the ovary and colloid carcinoma of the ovary it may be said that the latter differs in its physical characters to a certain extent. Carcinoma and sarcoma show a more uniform consistency, while colloid carcinoma is in part fluctuating and partly solid with a nodular and irregular surface. This condition, however, is also characteristic of ovarian cystoma, so that a clinical differentiation between these two growths cannot as a rule be made with any degree of certainty and consequently an exploratory incision is the proper course to pursue in order to ascertain the true nature of the growth.

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