

not; 3. It is possible that a tubo-ovarian cyst may be formed in a different way from the two preceding. The tube may be distended with pus or other irritating matter, which set up inflammation, and give rise to plastic effusions binding the fimbriated extremity to the surface of the ovary. Most frequently the matter escapes into the peritoneal cavity, and the peritonitis is widely diffused; but it may be wholly or in great part surrounded by the rapid throwing out of plastic matter which forms a cyst of the kind described.

The characteristic of these cases is their rapid formation under symptoms of ovaritis or peritonitis following upon sudden escape of ovarian fluid by the vagina, where there had previously existed a tumor, or symptoms of acute ovaritis or peritonitis with rapidly-forming swelling.

Cysts from development of wandering ova.—That ova impregnated, and especially non-impregnated, occasionally fall into the abdominal cavity, not being caught by the Fallopian tube, there is every reason to believe. When discussing the pathology of retro-uterine hæmatocele, and of extra-uterine gestation, this accident will be again referred to. In this place it is only necessary to refer to an hypothesis of Boinet, that ova which have gone astray in this manner may give rise to cystic growths:—"May not," he asks, "that happen for the formation of cysts of the ovary, which happens for fecundated vesicles? These are sometimes developed in the ovary itself, or in the Fallopian tube, or in the peritoneum, constituting abnormal gestations. May it not, then, happen that the non-fecundated ovum, diseased through causes referred to, may be pathologically developed either in the ovary where it remains fixed, or in the tube which it has reached, as at the moment of fecundation, or lastly in the peritoneum, into which it has fallen?"

Lloyd Roberts has published a case which illustrates Boinet's view. He removed a cyst by gastrotomy, which, after drawing off 17½ lb. of clear fluid of 1004 sp. gr., weighed 6 ounces. It was thin, homogeneous, highly vascular. It had no connection with the ovaries or their appendages. These were quite normal. He concluded that this was a stray ovum.

CUTANEOUS PILIFEROUS CYSTS; OR, DERMOID CYSTS OF THE OVARY.

Lebert gives the name of "dermoid cysts" to those structures, either in newly-formed or in pre-existing spaces, which show on the inner surface of a sac new formations, whose identity with the structures of the skin is unmistakable, as bone, cartilage, teeth, and hair. Tumors of this kind are not very uncommon in connection with the uterine appendages. They call for careful clinical study in relation to ovarian tumors, to ectopic gestation, to recto-uterine hæmatocele, and other pelvic tumors.

The walls vary in thickness. The inner surface is either smooth, or in places there are prominences. The superficial layer of the inner surface consists of thick layers of pavement-epithelium. Indeed, elements representing all those of skin are found. Hair, fat-glands, sweat-glands, are recognizable; so that along with hair we find the contents of the cyst to be a yellowish, fatty unguent, made up of free fat, cast-off pavement-epithelial cells, and cholesterine crystals, which sometimes distinctly

glisten. The general likeness of the interior of the cysts to skin had been often noticed. Kohlrausch demonstrated it.

It was at one time thought that these dermoid cysts were the result of an incomplete fructification of an ovum. But Baillie found them in children who had never menstruated; they have even been found in males. Anatomists now generally agree that they are quite independent of conception.

Brain-matter has been discovered in cysts of this kind by Gray, Chalice, Friedreichs, and Rokitsansky. Friedreichs even found recently-formed strong cords of broad nervous branches, and unipolar and bipolar pigmented ganglionic cells. Virchow has seen a similar case; and he has also described muscular fibres. Bone is sometimes developed. It is found in small scales or lamellæ in the areolar tissues beneath the skin-formation. These, as they grow larger, acquire the most extraordinary shapes, with branches and spicula. The osseous structure itself is that of genuine bone, the Haversian canals and bone-cells being arranged in lamellæ. This formation of bones may easily impose upon the observer the conclusion that he has to deal with an ectopic gestation. But a case recorded by Velpeau¹ suggests caution in this respect, and also that there is still obscurity hanging over the origin of these tumors. "A young man, aged 20, was admitted into the Charité with a tumor the size of a fist connected with the testicle. It had existed from birth. It contained several bones and parts of a foetus. It was imbedded in the testicle."

A case recorded by Hulke (*Path. Trans.*, 1873) suggested to Wilks that these cysts may be infectious, like cartilage when associated with malignant growths. In Hulke's case there was cancer of the uterus, a large dermoid cyst full of hair surrounded by several smaller cysts of the same kind, connected with the uterine appendages, and several similar cysts, withered, attached to the under surface of the liver. Hulke tells me he thinks all the cysts were old and congenital.

This formative power is well illustrated in a case, presented (*Path. Trans.*, vol. viii.) by the late Mr. Moore. The abdomen was larger than at full period of gestation. An opening formed near the navel, and discharged pus. The opening was enlarged, and about seven pounds of stuff like putty was removed. Vomiting came on, and the patient died. There was one vast cyst adherent at every part of its surface, except near the bladder. The wall was tough, in part cretaceous. It contained hair and perfectly-formed teeth. Left ovary not discovered. Among the peritoneal adhesions were many small cysts, some of which were attached by slender pedicles to the main cyst, whilst others were entirely unconnected with it, but like it contained soft, cheesy, yellow epithelium, mixed with hairs. But although the formative power is usually obstinate and persistent, the course of these tumors is, for the most part, slow, extending over many years.

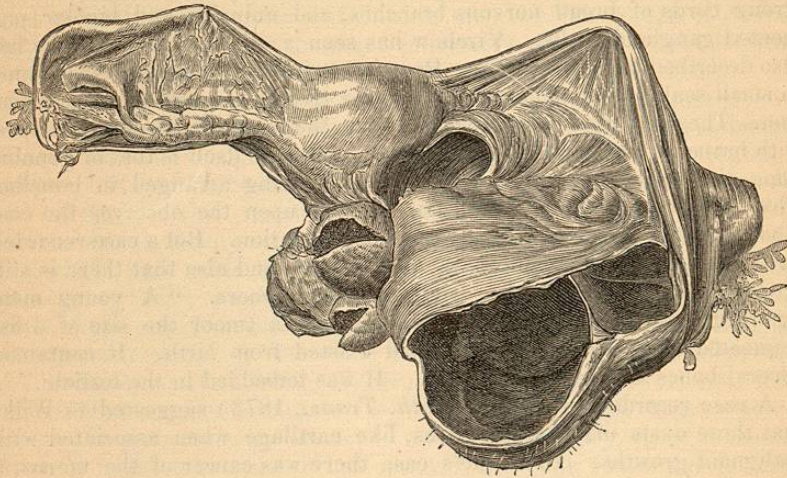
In the living body the fat exists in the fluid state. Thus there is a specimen in Guy's Museum (No. 2237²⁰) which, when opened, poured forth fluid fat, which immediately solidified. In another specimen (No. 2235) the fat was wholly soluble in ether. The hairs were imbedded in

¹ Archives gén. de Médecine, 1840.

the usual way in the sheaths; and abundant, large, well-formed sebaceous follicles opened into the hair tubes.

Mr. Wood exhibited a tumor containing hair and fat, which melted readily on being exposed to heat equal to that of the body. (*Path. Trans.*, vol. x.) Dr. Hare mentioned another case where solid fat was found in an ovarian cyst after death, but which melted at 85°. (*Path. Trans.*, vol. iv.) In 1874 I drew off by aspirator-trocar, from a cyst

FIG. 80.



A Dermoid Cyst of the Ovary (R. B.). (Half-size.) From Specimen in St. Thomas's Hospital Museum.

behind the uterus, 16 oz. of liquid fat, which set as solid fat when cool. Hair was afterwards extracted.

Ramsbotham (*Path. Trans.*, vol. iv.) describes a case of labor obstructed by a tumor in Douglas's space. The tumor was punctured by a long trocar through the vagina; a large teacupful of thick, yellowish matter, like thick custard, was collected; it became solid when cool, and consisted of fat globules. The tumor before puncture felt quite solid, no doubt from tension. Two cases, quoted from Ingleby, gave the same characters.

In St. George's Hospital Reports (1877) I have described a case similar to Ramsbotham's, as well as other cases illustrating the diagnosis and history of these tumors. I have little doubt that hair and teeth continue to be produced for years. Thus I have extracted tufts of hair at intervals during several years.

From the methods employed I have been satisfied that no bones were left in the cysts after the explorations. And with regard to teeth Schnabel¹ found more than 100 teeth of all sorts, and Paget found 300. Some of these were probably loose, and therefore had been shed, the follicles producing new ones. Indeed, Meckel says these teeth are subject to the

¹ Würtemberger Correspondenz-blatt, 1844.

same laws as to duration and development as normal teeth, successive sets being produced.

The hair is usually, not invariably, pale or blonde. Andral found it so in a cyst from a negress. It may be that exposure to light is necessary to full pigmental development. In one case, that of an old woman, some of the hair was gray. (*Axel.*) In the lower animals, dermoid products after their kind are found. Thus, in sheep, wool; in birds, feathers; in cows, cowhair, have been found. (*Lebert.*)

Dr. Gibbes¹ relates a remarkable case, in which labor being terminated by the forceps on account of syncope, the patient was harassed by the most intractable after-pains. A tumor was discovered above and behind the pubes, distinct from the uterus, and movable. On a subsequent day this tumor was felt *per vaginam* in the anterior cul-de-sac. It then increased rapidly to the size of the largest shaddock; and it was considered necessary to remove it. This was done, as by the operation for ovariotomy. It grew from the left broad ligament. About three inches of the Fallopian tube were included in the ligature. The cyst contained pus and a mass of fine black hair. Menstruation occurred at several successive monthly periods through the wound. The patient ultimately recovered.

Cysts of dermoid character have been found in combination with serous or colloid cysts in the same ovary. (*Lebert.*)

These tumors do not grow exclusively in the ovaries. Both kinds, says Paget, may be regarded as diseases of the same general group with the cutaneous proliferous cysts. The great formative power which they manifest is consistent with their occurring only in embryonic life, and in the ovaries, in which, even independently of impregnation, one discovers so many signs of great capacity of development.

A case interesting in its clinical as well as in scientific relations is recorded by Mr. Knowsley Thornton.² He tapped a very large abdominal tumor. Eighty-six pints of fluid looking like pus flowed; then fatty matter came mixed with little brown balls; next the canula got blocked from the fat solidifying in it and in the tumor under the influence of cold and the injection of carbolic acid. Hot-water bags and injection of hot water melted the mass, and the flow was resumed. The woman died in three weeks. The tumor came from the right ovary. The balls were glomeruli formed of short red hairs matted with cholesterine-scales, epithelium, and fatty matter. The tumor had been diagnosed after her first labor thirty-four years before her death, and she had been tapped nine years. The case shows three points: the long duration of these cysts; the great size occasionally attained; the solidification of the fatty contents under cold, and the practical lesson to keep the tumor and instruments warm during tapping. In one of my cases the trocar got blocked from the fat solidifying; it ran again when the instrument was well warmed. Occasionally the fluid as it runs out of a tapped cyst resembles gruel.

When these cysts are of ovarian origin the *symptoms* they produce are generally similar to those which attend other ovarian growths. They

¹ Amer. Journ. of Med. Sc., 1869.

² Pathological Transactions, 1876.

spring from the same seat; they extend in a similar manner. But they differ in several respects. Their rate of growth is usually much slower. They often date from an earlier age. They are mostly more solid and irregular in shape. Fluctuation is rarely so distinct; this symptom is not often developed, except as the result of suppuration or accumulation of fat. Dermoid cysts rarely attain so large a size as the dropsical tumors do. They more commonly terminate by setting up inflammation between some part of their walls and neighboring structures, and in this way effect communications with the hollow organs, as the intestinal canal, or the bladder, or else they form fistulous openings externally through the abdominal wall. In all these respects they more resemble the abdominal cases of extra-uterine gestation. For these indeed they are often mistaken. Like them they are apt to contract adhesions with the viscera amongst which they are imbedded.

It is rare, however, that this formation of fistulous outlets is attended by a cure. It is undoubtedly an attempt at elimination, but one which is only partially successful. If the attempt is towards the surface, the wall of the tumor forms adhesions with the abdominal wall; inflammation attacks the skin, and erysipelatous blush appears; the skin is thickened, tender; fluctuation appears; an abscess points and bursts, if it be not opened by the surgeon. The elected seat is often near the umbilicus on one side. Nothing but pus may be discharged; the swelling undergoes little diminution; suppuration goes on; the signs of hectic or irritative fever set in. Sometimes masses of hair, matted together, and quantities of fatty matter, may be present and be dragged out from the opening. This may go on for a long time, emaciation proceeding, and exhaustion ending in death. Teeth more commonly remain adhering to the walls of the cyst.

When these tumors form a communication with the bowel, the course of events is similar. Pus, mingled with hair, and occasionally a tooth, escape from time to time, producing attacks of severe pain. When a communication is made with the bladder, the most puzzling symptoms are apt to arise. Dysuria may harass the patient for years; generally cystitis supervenes, and sometimes attacks of retention of urine occur. When fatty matter or hairs make their escape, the diagnosis is clear, especially if a tumor be observed in one or other groin or at the pelvic brim. The cyst occasionally relieves itself partially at intervals, and then may be felt to diminish in size. The symptoms set up may be so severe, either by threatening life by acute inflammation or by obstruction to the bladder, or by exhaustion from irritative fever, that an operation for removal of the tumor may be indicated. The operation for extirpation must be conducted on the same principle as that for extirpating ordinary cystic tumors of the ovary. But to relieve the bladder it may sometimes be enough to dilate the urethra, and bring away the offending matters.

I have now under care with Dr. Crisp, of Chelsea, a case in which two fistulous openings have been formed near the umbilicus, and another into the bladder. At times urine or pus escapes by one of the abdominal fistulæ, and gelatinous pus by the bladder. The case was first seen by the late Dr. Ramsbotham more than twenty years ago. She has never been pregnant. The free external vents give her security.

In a considerable proportion of cases the termination is accelerated by pregnancy and labor. The pressure of the gravid uterus and of the child during labor injures the cyst, and disposes it to inflammation. But for the accident of pregnancy it may remain quiescent and unsuspected during life, to be discovered only on autopsy. Denman cites a fatal case. In St. George's Hospital Reports (1877) I have related several illustrative cases.

Treatment.—When there is evidence by pointing of working towards the surface, it is wise to open the abscess by a bistoury. This should be done cautiously, to a limited extent, in the first instance. This incision may be subsequently extended, perhaps crucially, and the cavity of the cyst explored by sound and finger. Tapping will detect fat. The sound will detect teeth; and the small hook (Fig. 81) will detect hair. In this way we may facilitate the evacuation of the contents. The cavity may be washed out with Condry's fluid, weak solution of iodine, or weak carbolic acid. Generally a fistulous opening remains for an indefinite time, leading to hectic fever. It is therefore desirable to make tentative incisions with a view to extirpation. The adhesions they are so apt to contract will, however, often frustrate the attempt. It might be justifiable to lightly cauterize the inner surface of the cyst with the galvanic cautery, to modify its character. It is scarcely probable that much inflammation would be excited in surrounding healthy structures, and when the sloughs had been discharged, the cyst deprived of its formative elements would contract and the fistulous opening close.

Since the generally elected seat of these tumors is the recto-uterine pouch, they can in most instances be attacked with the greatest advantage by the roof of the vagina, or through the rectum. The vagina is to be preferred. An exploratory opening may first be made with the aspirator-trocar, or with the modification of this instrument I have devised for the purpose. The cyst having been examined by the sound and its nature determined, it is better to enlarge the opening so as to give free vent to the fluid, hair, or teeth. The best way to do this is, the patient being in lithotomy-position, in anaesthesia, to open the cyst to the length of an inch or more by the thermo-cautery knife. Then a drainage-tube can be inserted, and the washing out is facilitated. From time to time we may estimate the size of the cyst by the sound, and by means of a small hook, made by bending the stilet of a catheter (Fig. 81), swept round inside the cyst, we are pretty sure to entangle any hair that may be in it. In this way I have frequently fished out tufts of hair.

FIG. 81.



(R. B.)