THE FENESTRATED BROAD LIGAMENT CLAMP.

WITH SOME REASONS FOR DEVISING IT.

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The idea of devising a new clamp occurred to me in consequence of the force necessary and trauma often caused while clamping infiltrated, inextensible and stiffened broad ligaments during salpingectomy or oöphoro-salpingectomy, especially in cases where the abdominal walls were markedly thick, even though exposure were made by a longer median incision than usual.

To ligate before removing the tube in cases of sacto-salpinx purulenta also has the disadvantage of manipulating an infectious pus sac, with the possibility of rupture, as well as occupying more time than clamping, excision and ligation.

Observations of cases of pus tubes in various stages

Fig. 1.—Fenestrated clamp applied; excision of adnexæ through fenestra; then application of ligature.

has demonstrated that we may almost speak of the mechanism of the formation of the pus tube even if the findings differ widely in different cases.

The normally situated tube under conditions of purulent inflammation undergoes increase in size, length and weight, especially at the distal or fimbriated extremity, tending to descend posteriorly and medianly toward the uterus, often enveloping the ovary.

One frequently finds evidence that this *descensus tubæ* occurred before the inflammatory process had penetrated entirely through the tube wall to the serosa, so that the ovary is often found unimplicated at the time of the operation. This cornucopia-like rolling up of the tube often continues till the closed fimbriated extremity lies at the bottom of the cul-de-sac. The detachment of the tubes from their adherent positions can be naturally most easily accomplished by the observation of the rule to deliver by the inverse manner of the production of the malposition.

After delivery at the abdominal opening, the method of clamping, excision and ligation, in turn, and covering of the stump to best avoid infection and operative sequelæ, especially adhesions of stump edges and surrounding viscera, is of the utmost importance.

The oblique method of applying the clamps is not devoid of objections; the outer, or infundibulo-pelvic, clamp is not always capable of being applied without serious danger of the necessary manipulation causing rupture of the sactosalpinx; while that of the uterine end often markedly increases the intratubal pressure, also adding to the liability of the same accident, besides perhaps causing increased shock due to the crushing of so important a structure as the tube. Also in excising the adnexæ obliquely downward from either end, the parametrium is opened at its base, a very great objection in any case, but especially where there is an escape of pus (perhaps not yet sterile) probably accounting for some of the cases of secondary parametric abscesses.

Another objection is the extent of broad ligament excised, unduly weakening it through its whole height,

Fig. 2.—Cornua and ligated broad ligament puckered at lateral border of uterus; covered by peritoneum by suturing round ligament to the posterior uterine surface and broad ligament.

often with consequent change in the position of the cervix and probable malversion and, despite the most careful suturing, the leaving behind of raw edges, with resultant adhesions.

With the fenestrated forceps the excision is entirely horizontal, the infected adnexa can be excised at once, the stump of the broad ligament is capable of being puckered at the lateral border of the uterus by being drawn toward the most fixed point, i. e., the uterus, through the lateral edge of which the suture is first passed. The round ligament is now drawn over the sutured cornua and broad ligament stump and is sutured to the uterus and broad ligament as in the accompanying picture, thereby effectually and easily covering them as well as maintaining the uterus in anteversion.

While I feel that an apology is due for adding one more instrument to an already overcrowded armamen-

tarium, I still feel that any effort toward simplifying an operation that, despite its commonness, has not yet reached the uniformity it deserves, should be presented for consideration.

INFILTRATING AND METASTASISING SARCOMA OF THE RAT.*

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A forthcoming number of the *Journal of Experimental Medicine* will contain a detailed description of a mixed-cell sarcoma of the rat which presents many points of similarity with sarcoma of man. The original tumor sprang from the seminal vesicle of a white rat and it has since been transplanted successfully to several hundred rats, both white and mixed gray and white. At first the number of successful transplantations was variable and sank as low as 20 to 30 per cent., but in the last months the successful results have in certain series reached 100 per cent. and averaged about 95 per cent. This increase was achieved by selecting the more rapidly growing tumors, in a young state, for the inoculations.

The inoculations have been made under the skin into the muscles, and into the peritoneal cavity. The subcutaneous nodules tend to invade the skin and to cause ulceration; the intramuscular nodules penetrate deeply into the surrounding tissue and substitute themselves for muscle, connective tissue, cartilage and bone. The tumor is especially characterized by its infiltrative growth. It is not surrounded by a capsule except in the early stages, but it grows freely at its periphery into the surrounding tissues. The early growths in the subcutaneous tissues are freely movable, but later on they attach themselves either to the skin or to the muscles, sometimes, indeed, to both skin and muscles, and gradually supplant the normal structures. A bit of the tumor planted deeply in the muscles of the back will gradually, as it grows, push itself outward toward the superficial fascia and inward toward the spinal column and ribs. The unyielding bony and cartilaginous structures are caused to be absorbed by pressure, or by the ingrowths of strands of tumor cells into their substance.

The intraperitoneal inoculations give rise frequently to multiple tumors. The original tumor developing from the transplanted fragment of tissue is the largest nodule; but other nodules of relatively large size are commonly present in the omentum, the mesentery of the duodenum and between the liver and the diaphragm. Smaller miliary foci of tumor growth occur elsewhere in the peritoneum. A frequent localization of the tumor in the peritoneal cavity is between the cardiac end of the stomach and the diaphragm, through which the stomach is attached firmly to the diaphragm, and the tumor grows through the wall of the stomach into its lumen, where it becomes subject to the digestive action of the gastric juice. Typical cup-shaped ulcers with firm elevated edges have been produced in this way.

The intramuscular inoculations, if made in the abdominal muscles, can give rise to intraperitoneal growths. In this case the tumors penetrate the muscular walls and become intraperitoneal. They then conduct themselves as if they had been originally produced by intraperitoneal inoculation. If the growth from

without is through the posterior abdominal wall, the kidney may be displaced forward and it may also be nearly or completely destroyed by the tumor invasion. Ascites occur, with which may be associated a diffusion of microscopic masses of tumor cells throughout the peritoneal cavity, from which general miliary sarcomatosis of the peritoneum may result. The diaphragm is involved, probably by direct lymphatic infection.

A striking feature of the tumor is its tendency to produce large metastases. These occur, in order of frequency, in the lungs, the peribronchial lymphatic glands, the intercostal muscles and the ribs, the kidneys, regional lymphatic glands, and the heart. The metastases may reach a very large size, especially in the lungs and kidneys. A large segment of a lung or a kidney may be involved.

Rats which have primary tumors may be inoculated a second time successfully. The second growths are as rapid as the first, although the percentage of successful second implantations is below that of the controls. The secondary inoculation succeeds in animals in which no visible metastasis has occurred and in which the original growth is the only nodule in the body, and it succeeds equally in animals in which metastasis has already taken place. No marked difference in susceptibility of the rat as yet been made out as respects these two conditions.

Rats which have successfully withstood one inoculation are less subject to another inoculation with the tumor than control rat or rats in which a tumor is already present. In other words, it appears that rats which have withstood inoculation originally with the less active tumors have been rendered, in some degree, refractory in inoculation with the more active tumors.

A certain but small percentage of spontaneous recoveries takes place in rats which have originally developed inoculation tumors. By treatment with salt solution and photodynamic anilines the living tumor cells can be so modified as to influence the number, or percentage, of the rats making spontaneous recoveries. There are indications that the rats which have recovered from a growing tumor are more refractory to a subsequent inoculation than normal rats.

The histologic appearance of the tumor places it probably among the mixed-cell sarcomata. The cells are spindle shaped and polyhedral, and not a few giant cells are also present. There is moderate development of fibrillated basement substance. In parts of certain tumors, tubular or irregular alveolar structures can be discerned. Taken all together, however, it seems advisable, for the present at least, to consider the tumor as a mixed-cell sarcoma.

Syringe for Injecting Solid Paraffin Into the Tissues in Ozena.

—R. Botey of Barcelona describes in the *Arch. Internat. de Laryng.* 1906, xxii, 855, a syringe of his own devising that forces cold, solid paraffin in a fine jet out of the needle. Great pressure is exerted on the piston by a spring in the nutcracker handles, acting on a click and ratchet mounted on a screw thread on the stem of the piston. The paraffin issues more gradually and with greater force than with any of the other syringes yet made. In paraffin treatment of 360 patients with ozena during the last four years, he has made about 7,200 injections in all. In about a third of the cases the paraffin was expelled later, but in the others the patients were cured or immeasurably improved. His experience indicates that about 10 per cent. of patients with ozena are beyond relief, 25 per cent. can be very much improved, 45 per cent. can be practically and 20 per cent. can be completely cured by treatment including injection of cold hard paraffin.

* From the Rockefeller Institute for Medical Research, New York.