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by
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O O P H O R E C T O M Y .

I. DEFINITION.- Oophorectomy comes from the Greek word ($\omega\omicron\nu$, egg; $\phi\epsilon\rho\epsilon\nu$, to bear; $\epsilon\kappa\tau\omicron\mu\eta$, excision.) meaning excision of the ovary. There are several terms that are used synonymous with Oophorectomy, but some are misused, ovariectomy, ovariectomy, spaying and ovaro-hystorectomy.

II. HISTORY.- Ovariectomy is one of the oldest operations in veterinary surgery, it originated about the same time as the same operation in women. Ovariectomy is both described by ancient and modern writers. It is mentioned by Aristotle (4th Century B. C.), Varro (1st Century B.C.) and Pliny (1st Century A.D.). No mention of it is given during the middle ages. The modern writings on the subject date back to the 17th century Barthol-di in 1662 speaks of spaying mares and cows through the flank. This operation was of common occurrence in Denmark at this time. The operation in women was revived by Morand, a Frenchman, in 1667, who was then secretary of the Paris Academy of Surgery.

At the beginning of the 19th century, ovariectomy in both women and domestic animals was revived on the European continent and the operation on women was introduced in America by Dr. Ephriam McDowell of Danville, Kentucky. Dr. Nathan Smith performed the operation successfully in 1821 but the operation did not obtain general recognition until 1824, when a paper was published by Dr. Luzers in the Edinburg Medical and Surgical Journal.

Thomas Winn, a Louisiana farmer, in 1813, was the first in America to perform ovariectomy in domestic animals successfully. It was practised in 1823 by Blundell as a cure for dysmenorrhoea. In 1872 the operation came into modern surgery of domestic animals, its use being for varied purposes.

At one time the operation was considered very dangerous, especially to the mare, owing to the extreme sensitiveness of the peritoneum to infection, but since the era of antisepsis, abdominal operations are made feasible with but little fear for the welfare of the patient. Experience has taught us that the sensibility of the peritoneum is not of such importance as was formerly believed if strict asepsis is observed in penetrating the cavity.

III. ANATOMY AND PHYSIOLOGY.- The ovaries, two small ovoid bodies, are situated on the internal face of the broad ligament close to the middle of the anterior edge in the mare, and the inferior internal face in the cow. The broad ligaments, two in number are folds of the peritoneum originating from the lumbar region and descending toward the uterus to fix themselves upon the sides of the superior face of the body and cornu in the mare and to the sides of the inferior face in the cow. The anterior border of the broad ligaments are free and give support to the oviducts and ovaries. Between its layers are the utero-ovarian artery, vein, lymph vessels and nerves, which pass to and from the ovary. The round ligaments which often aid in locating the ovary, springs from the inguinal canal and passes to the cornu, attaches itself near the extremity. It is round, hard and fibrous, corresponding to the gubernaculum testis of the male. The oviducts, two in number, variable in size, extend from the ovaries to the cornua.

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or horns of the uterus. The cornua, two in number, are dilations of the oviducts. They form the connection between the oviducts and the uterus. The uterus is posterior to the cornua and of variable size. It is very small in the multiparous animals. The vagina is a large muscular tube connecting the uterus with the vulva which is the external genital organ.

The location of the uterus and its appendages is in the pelvic cavity. The cornua extend forward to the lumbar region. The rectum is above the uterus between the broad ligaments, the bladder is below the uterus and vagina.

The physiology or function of these different organs are as follows:- The ovary is the reproductive gland of the female. The oviducts or fallopian tubes are to carry the ova to the cornua where they meet the spermatozoa of the male which enter the uterus through the vagina. The uterus and cornua contain and nourish the foetus during uterine life. The vagina forms the passage way for the foetus from the uterus to the exterior and the entrance of the spermatozoa of the male to the uterus.

The ovaries are composed of epithelial tissue. The rest of the organs are composed of an epithelial layer which is the internal, then muscular layers which are composed of fibres running in various directions and a serous layer which is the outer covering.

IV. OBJECT.- The object of spaying is two fold or physiological and pathological.

A. The physiological object is gain in the commercial value it gives the meat of spayed animals especially in the heifer, sow and ewe, for it brings their food products on an equal value

with the steer, barrow and wether. Spaying also renders reproduction impossible and which is of great annoyance in the feed yards for it often occurs when the animal is nearly ready for market, thus rendering the animal unfit for the market, causing the feeder to lose greatly in his feeding. Again it stops the period of oestrus or heat in the animals which is very annoying in the feed lot, both to the other animals and the one concerned for the animal while in heat does not make an appreciable gain. Spaying often increases the racing value of mares for it renders them always the same. Oftentimes a mare when in heat will run along beside of an entire male and cannot be gotten to pass him while the spayed mare pays no attention to the opposite sex. Again the mare and bitch are weakened by the period of oestrus so that they cannot run as good a race. The ethical value might be mentioned in spaying in the bitch and cat. In the case of the bitch it does away with the yard full of dogs at the period of oestrus which is often very embarrassing and in the cat it does away with many of the cat calls which render the nights hideous. It also renders these animals more docile, makes them more attentive to their work by curbing their roving disposition and gives them cleaner habits, especially when they are kept as pets.

B.- The pathological object of spaying is of two kinds, one is spaying in the case of malformations to prevent the animal from conceiving when it is positively known that she could not deliver a foetus, the other is the case of diseased ovaries as nymphomaniacs, cystic ovaries or other diseased conditions of the ovaries which impair the general health of the animal as excessive bleeding at the period of menstrual flow. In cases of vicious

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habits as kickers and fighters which are disagreeable to work. Ovariectomy in women is often only partial, just the diseased portion of the ovary being excised, for the cure of dysmenorrhoea and menopause.

V. THE OPERATION.- In the cows there are three ways of operating, through the right or left flank, the left being the preferable owing to the anatomy of the bovine; through the linea alba and through the vagina. In the case of the mare there are two methods of operating, vaginal and through the flank. The vaginal method is the one most used as it does away with the direct communication of the peritoneum with the exterior which is exposed in laparotomy. In the case of the ewe, sow, bitch, and cat there are two ways of operating, through either flank or through the linea alba.

PREPARATION.- Preliminary preparation. All animals should be fed on half rations, the day before the operation and should have no feed on the day of operation. In the case of the mare and bitch the feed should be of a laxative nature or a dose of laxative medicine should be administered the day before the operation. The operating field should be sheared or better shaved and thoroughly cleansed, the operator's choice of disinfectants may be used.

POSITIONS.- Standing or lateral recumbency for the flank or vaginal operation in the mare and cow for the linea alba operation swung up by the hind limbs or held on the dorsal position. In the case of the smaller animals the lateral recumbency for the flank operation and swung up ~~by~~ the hind limbs for the linea alba operation.

RESTRAINT.- The mare should be securely confined in the

stocks for the standing position, all four feet should be fastened to the floor and bars put under her to prevent her from dropping down and a girth or bar across the back to prevent humping and straining while operating. For the lateral position the English hobbles are the best method of restraint, this brings all four feet together rendering it impossible for the mare to get up. The stocks may be used for the restraint of the cow for the vaginal operation. For the flank operation standing the shoot may be used, the side next the operator should be about three feet high for heifers. They should be tied firmly, by the halter or around the neck as short as possible and bars passed under them to prevent lying down and they should also be fastened down by the tail to prevent them kicking over the shoot with their hind feet.

For restraint in the latter recumbency, the front feet should be fastened together and the hind feet fastened together, then the animal stretched out and held in that position.

The restraint of the smaller animals is simple. The mouth should be tied shut in all cases to prevent the animal biting the assistants and in the cat the fore-paws should also be tied to prevent scratching, then swing them up in a three cornered trough by the hind legs for the linea alba operation. For the flank operation tie them on a table with the side up from which you operate.

INSTRUMENTS.- For the vaginal operation, long ecraseur and guarded bistoury. For flank operation bistoury, spaying shears or spaying emasculator, spaying needle thread and needle forceps.

TECHNIQUE.- In the mare pass the hand with the guarded bistouri through the vulva into the vagina, then wait for the vagina to balloon, which is the dilating of the vagina that takes place when anything is introduced into it. This only occurs in the mare, when the vagina has properly dilated, unguard the blade of the bistouri and make a stab incision through the vagina wall just above the os uteri, direct the bistouri forward and slightly downwards, be sure that the peritoneum is punctured but do not pass the knife too far into the abdominal cavity for it is very easy to puncture the iliac artery also, then with the fingers in the form of a cone enlarge the incision without the bistouri until the entire hand can be passed into the abdominal cavity, next find the division of the uterus and trace along the cornu till the ovary is located, then pass the ecraseur in along the arm having the loop of the chain open large enough to be easily passed over the ovary, be sure you have an ovary instead of a ball of feces, then gently tighten the chain, while tightening the chain pass the hand around the ovary to make sure there is no loop of intestine included with the ovary, keep hold of the ovary so that it will not be lost in the abdominal cavity, when excised bring the ovary into the vagina and in like manner remove the remaining ovary.

Technique in the cow. The vaginal operation in the cow is the same as in the mare with the exception that the vaginal tensor has to be used which is an instrument, the point of which can be placed into the os uteri so that the os may be pushed downwards and forwards, thus tensing the vaginal wall.

In the flank operation start the incision about the center of the triangle, formed by the posterior border of the last rib external to the lumbar vertebra and the transverse process of

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the lumbar vertebra and the exterior angle of the ilium, through the skin and abdominal parietes downward for five or six inches, the peritoneum may be incised or ruptured with the fingers, then pass the hand into the abdominal cavity downward and backwards to the uterus, then follow along the cornu till the ovary is located, then pass the spaying shears into the abdominal cavity along beside the arm and clipp off the ovary, due care being taken not to cut the intestines, always holding to the ovary so that it will not be lost in the abdominal cavity. The ovary may be brought to the opening and removed with the shears by turning the palm of the hand upwards without withdrawing the hand; in like manner remove the other ovary and suture the incision in the skin and abdominal muscle, with the spaying needle and saddler's linen, with continuous sutures. The skin incision should be a little longer than the muscular and left open for drainage at the lower end.

The linea alba operation is the same as the flank operation with the exception of the location of the incision which is made just posterior to the umbilicus on the medium line.

Technique in the sow.- The flank operation is performed quite similar to that in the cow only the position is always lateral recumbency. The incision is started about two inches anterior to the external angle of the ilium and made directly downwards. The removal of the ovaries and suturing is practically the same as in the cow. The linea alba operation is practically the same as in the cow.

Technique of flank operation in the bitch.- The incision is started in the angle formed by the posterior rib and the transverse processes of the lumbar vertebrae. It is made downward and back-

wards one to two inches in length owing to the size of the operator's finger. The index finger is passed into the incision to one side of the rectum until it strikes the psoae muscles, then it is hooked backwards and a little to one side under one of the cornu, then bring the cornu to the incision, then run along it anteriorly to the ovary, work the ovary loose from the abdominal wall and excise it from the Fallopian tube, then run back to where the cornu joins the uterus and take up the other cornu and remove the other ovary in like manner, then suture the incision through the skin and muscles at the same time.

Operation by the linea alba is easier and the more desirable on account of the scar being made by the incision is out of sight. The incision is made just posterior to the umbilicus on the medium line. In this case the ovaries can be brought outside of the incision and excised, if the animal is not too large, without tearing them loose from their abdominal attachment.

The operation in the cat is indential with that in the bitch except the incisions should be no larger than absolutely necessary.

After treatment is little or none. If the wound suppurates very freely, it should be washed and disinfected. The stitches should be removed in four or five days especially if silk thread is used. If cat gut is used they will be absorbed or they will slough out of their own accord. If the animals are operated upon during the fly season, tar should be applied to keep the flies from "blowing" the wounds. It might be well to keep them separated from the other animals for a few days but this is not absolutely necessary.

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ANAESTHETICS.- If it is thought best to anaesthetise the animal, chloroform for the cow and mare, ether for the bitch and cat, and A.E.C. mixture for the sow, which is one part of alcohol, two parts of chloroform and three parts of ether.

PER CENT. OF LOSSES.- Varies in different species. In the mare the losses are quite high being in the neighborhood of twenty-five per cent. In the cow, sow, bitch, and cat, it is only a little over one per cent, when the operation is performed without an anaesthetic.

RESULTS.- The results are usually favorable and consist of an increased fattening ability, stoppage of reproduction, menstrual flow and make a brighter, stronger and more attentive animal, especially in the case of the bitch.

SEQUELA.- The sequela may result in any of the following conditions, such as hernia, or prolapse of the intestines, septic infection, peritonitis, enteritis, no desire to eat, in some cases the menstrual period is not stopped, the animal continues to mate with the male but does not conceive or it may result in collapse and death.