Laparoscopic Cholecystectomy in Swine-
Experimental Model For Human Medicine

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Abstract. The cholecyst, a real annex of the digestive duct whose secretion participates
directly to the digestive process can experience numerous clinically manifested
dysfunctions.(especially in human medicine), differentiated according to the nature of the
pathogen.Laparoscopic interference of irreversible cholecystopathies, supposes cholecystectomy.The
clinic of Pathologic surgery of the Faculty of Veterinary Medicine Bucharest in collaboration with the
Centre of Laparoscopic Surgery of “Saint John”hospital in Bucharest have studied the advantages and
advantages of swine utilization as a pattern for training in human laparoscopic cholecystectomy 96
pigs weighing 15-40kg were involved in this study within two years.
The results obtained confirmed the target proposed and pointed out the technical aspects of
laparoscopic interference for veterinary medicine as well as that swine by their anatomic features
similar to human beings is the corresponding model for training.

INTRODUCTION

The swine model is frequently used in experimental studies for human medicine.The
reasons for swine utilization for such studies are determined by the anatomic resemblance of
this species with humans.The same criterion is for a great utilization of the swine for human
surgeons training in carrying out different surgical techniques.

MATERIALS AND METHODS

The study we are presenting here was carried out at the Faculty of Veterinary
Medicine,Bucharest together with the Training Center from the Hospital”Sfântul Ioan “ in Bucharest.
The material utilized in this experiment consisted of 36 swine of 20 and 30 kilos
weight which were under cholecystectomies by laparoscopic method.
All animals were tranquilized with the corresponding dose of Stresnil 1ml/20kilos
living and 10%Ketamina i.v.1-2 ml/head, after that the animals were anaesthetized using an
equipment of inhaling anesthesia with izofluran and the artificial lung.During the whole
operation ,the animals were monitored considering cardiac and respiratory frequency as well
as the body temperature.The inhaler anesthesia is compulsory in such operations for creating
work space,CO₂ should be introduced into the abdomen.
The liver in swine being different from the human one has two right lobs and two left
lobs , the gall bladder is placed between the right intermediary lob and the square lob.(1).
Cholecystectomy

After the animals were tranquilized they were immobilized in the dorsal decubitus and with 25-30 degrees caudal cranial inclination, anesthetized, then the surgical site is prepared by depilation and is isolated with a surgical site.

The equipment and instruments for cholecystectomy by laparoscopic method was offered by "Karl Storz" Company, Romania. After the anesthesia was performed, CO₂ insufflations of peritoneal cavity was done by Verres Needle at a pressure of 12 mmHg. 5 trocars were mounted so that there should be a triangle consisting of the two trocars for working instruments and an optic trocar for visualization.

The pneumoperitoneum carrying out and the optic trocar mounting are performed without a visual control but the other trocars can be seen considering the organs position and the preference of the surgeon.

The surgical team is represented by a surgeon, a cameraman and an assistant.

The liver and cholecyst are placed on one of the trocars already mounted, a device like a fan is introduced, the liver is raised and maintained in the desired position so that the gall bladder should be at the forefront.

The operation itself consists in the cystic duct dissection together with the vascular cord, their individualization and two forcepressure metallic clips on the proximal extremity and one on the distal extremity dissecting between those two ligatures. The assistant catches the end of the dissected cord and the surgeon dissects and cuts with the electric scalpel, the mezou between the cholecyst and hepatic parenchyma performing the haemostasis also. After the total removal of the cholecyst, it is taken out by one of the trocars.

The haemostasis is checked, the abdominal cavity is depressurized, the trocars are taken out and a thread is placed on the abdominal wall for each orifice. The animals were awakened and took their normal life.

RESULTS AND DISCUSSIONS

The cholecystectomy carried out with 36 swine of 20 and 30 kilos weight emphasized the anatomic resemblance of the liver topography and permitted an easy operation in conditions of maximum security. The 36 operated swine survived and were fattened up to the normal weight for economic slaughter. No research concerning the daily medium benefit in comparison with the animals which were not operated was carried out and we cannot draw conclusions concerning this fact.

The estimation of the advantages and disadvantages of this method of laparoscopic laparatomy for swine emphasizes: the extension of the surgical period, the high cost of anesthesia, expensive equipment for laparoscopic operations as well as the training of the surgeon which is completely different from the classic surgery.

The advantages of the method can refer to the reduction of the intrasurgery infection risk, easy intrasurgical haemostasis by the utilization of electric scalpel, metallic clips instead of classic ligatures on the vascular mezou and cystic duct. The video surgery proves its superiority in comparison with the classic surgery especially for the human medicine where the postoperative convalescence in cholecystectomy is done by the incision on the wall. (5,6)

This training for the human surgeon proves to be useful but this surgical technique carried out on swine is well standardized reproducible and uses standard equipment for human laparoscopy.
The method to train the human surgeon by swine model utilization proved to be better than the method of utilizing human corpse or an anatomic piece placed inside of a pelvic trainer offering operatory conditions in vivo.

The errors of laparoscopic technique inherent for beginner were commented and they were offered solutions for preventing mistakes and intra postoperative complications. A possible hemorrhagic accident during the dissection gave the possibility of solving it in real conditions.

CONCLUSIONS

1. The swine represent the model of training in vivo ideal for the best laparoscopic cholecystectomy for human surgeons.
2. Laparoscopic cholecystectomy opens new prospects for veterinary surgery.
3. This type of operation involves the relationship between the surgeon and the computer and also for the veterinary surgeon.
4. The swine model has a special anatomic advantage for the human surgeon specialization.

REFERENCES

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