

## **COMPARATIVE STUDY OF THREE METHODS OF TONSILLECTOMY IN DOGS**

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### **ABSTRACT**

Eleven dogs were used in this study. The animals were divided into three groups: group one, in which the tonsil glands were ligated and then resected by scalpel; group two, the tonsils resected by electrocautery; group three; the tonsils were excised by electrocautery with help of an laparoscope. The clinical findings, after two days of operation, at the excision sites appeared redness in color and slight swelling. These signs disappeared at 4-6 postoperative days in group one, while in second and third groups, it extend for 5 - 7 days. Healing of surgical sites occurred 10-12 days after operation in the first group, while in second and third groups, healing occurred in 11-14 days, respectively. The modified use of a rigid laparoscopic toll in the third group for tonsillectomy, was found to be easy for application of the method and given good results.

### **INTRODUCTION**

The tonsils are lymphoid tissue covered by respiratory epithelium, which located on the dorso-lateral wall of the oro-pharynx just caudal to the palatoglossal arch. The tonsils are active in the synthesis of immunoglobulin. Although healthy tonsils often immune protection, diseased tonsils are less effective at serving these immune function (1 and 2). The primary causes of tonsillitis include bacteria, viruses and foreign bodies. The most common pathogenic bacteria are alpha and beta hemolytic streptococci, staphylococci and coli forms in both dogs and cats (3 and 4). A foreign body such as a grass awn or a piece of wood lodged in a tonsil may cause tonsillitis. Secondary tonsillitis result from other disease processes such as pharyngeal irritation, periodontal disease and licking of infected skin or anal sac can lead to chronic contamination of the mouth with pathogens (5). These glands sometimes grow as large and scirrhous as to become incurable and even to threaten suffocation if not extirpated. The main indications for tonsillectomy are chronic recurrent tonsillitis that is unresponsive to antibiotics, acute tonsillar enlargement causing mechanical interference with swallowing or airflow and neoplasia (2 and 6). Also adenotonsillectomy were used to decrease the frequency and severity of recurrent otitis media (7). On other hands (8) described that tonsillectomy efficacious in reducing the number and severity of subsequent episodes of throat infection. Hemorrhage is the most common complications of tonsillectomy, it may be primary occurs within first 24 hours, while secondary hemorrhage was occurred between 24 hours and 10 days after operation. Other complications include pain, dehydration, weight loss, fever, post operation airway obstruction, pulmonary edema, and local trauma to oral tissue, tonsillar remnants, voice changes and death which usually related to bleeding or anaesthetic complications (9). Other workers (10) said that

tonsillectomy was considered and safe but many complications have been described such as cervical subcutaneous emphysema and pneumomediastinum are immediate complications relatively infrequent. Three most common techniques for tonsillectomy were described by (11), the first technique in which the tonsil was grasped with Allis tissue forceps and retracted from the tonsillar crypt. All deeper tonsillar tissue was exposed. Then the tonsil and tissue was excised with metzenbaum scissors beginning rostrally and cutting caudally bleeding was controlled by ligation of blood vessel. The second technique for tonsillectomy in which the tonsillar base was clamped with a curved Kelly hemostate and the base ligated with 2-0 chromic catgut, then the tonsil was excised. After that the tonsillar fold was sutured with a parker-Kerr or simple continuous suture. While third technique for tonsillectomy was achieved by using a tonsil snare, the snare placed around the base of the tonsil and closed. The crushing action contributes to homeostasis.

The aim of this study was to investigate the benefits achieved by the modified use of a rigid laparoscopic toll for tonsillectomy, in comparison with the other radical methods of tonsillectomy in dogs.

## **MATERIALS AND METHODS**

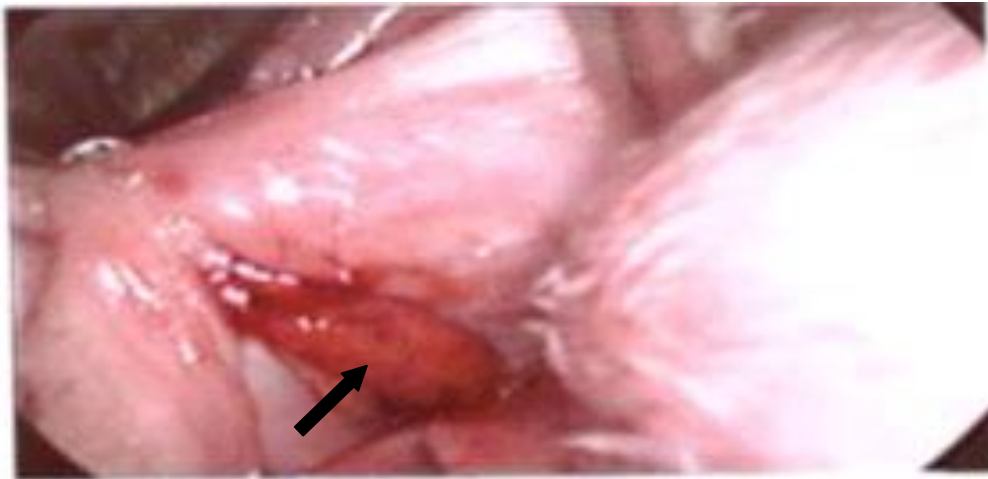
Eleven local breed dogs were used in this study. The average ages were 2-6 years and their weight ranged between 13-20 kg. The animals were allotted into three groups: first, second and third groups, which included 4, 4 and 3 animals respectively. In group one, the tonsil glands were ligated and resected by scalpel. While in group two, the tonsils were resected by electrocautery. In the third group, the tonsils excised by using electrocautery with the help of an laparoscopic surgery (Karl Storz). The operative laparoscopic system (Department of Surgery and Obstetrics, College of Veterinary Medicine, University of Mosul, Mosul Iraq), was connected to a video camera and xenon light sources offered an excellent color reproduction for video digital technology that allowed magnification of the surgery site for up to 15 times actual size, permitting surgeon to see anatomical structures in exquisite detail. In this study, the rigid telescope was inserted into the mouth cavity to visualize the surgical field and electrocautery was used to resects of the tonsils. Surgical operation were done under general anesthesia using atropine sulphate 0.04 mg/kg B.W intramuscularly as a premedication, followed 10 minutes later by intramuscular administration of a mixture of ketamine hydrochloride 5%(15 mg/kg B.W), xylazine hydrochloride 2%(5 mg/kg B.W). The animals were positioned on ventral recumbency. The mouth was widely opened and secured with gauze. The tongue drawn forward and a good light in first and second group were directed into the mouth cavity to visualize the surgical area. While in third group excellent light of telescope was provided good visualization of the surgical site.

In group one; the tonsil was investigated in tonsillar crypt on the dorsolateral wall of the oropharynx (Figure, 1). The edge of the crypt was retracted and grasped caudodorsally with Allis tissue forceps to expose the tonsil from the crypt. Curved artery forceps was applied at the base of tonsil (Figure, 2), then ligation below the forceps with chromic catgut (2-0) (Figure, 3). After that, the tonsil was excised from its base by scalpel, then the artery forceps was removed. Similar procedure was applied to the tonsil of other side.

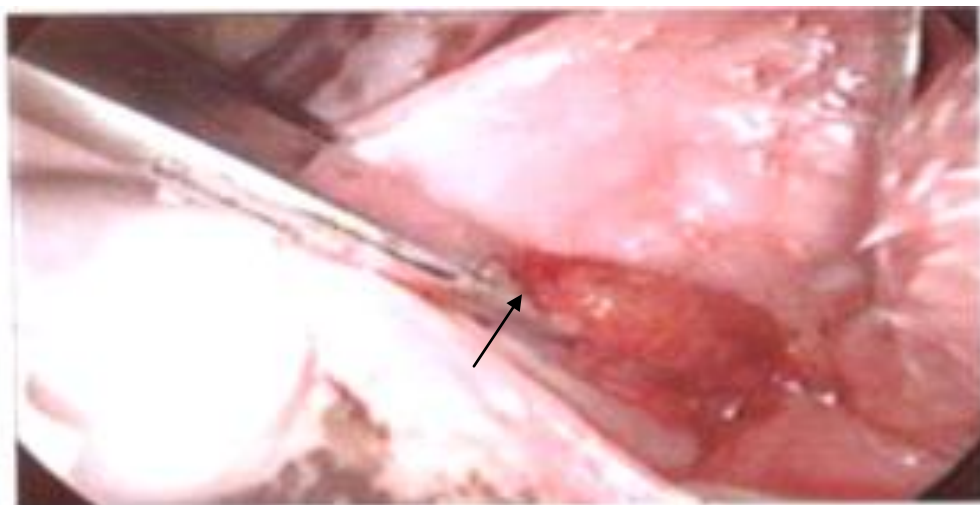
In group two, the tonsil was exposed from the tonsillar crypt and grasped by Allis tissue forceps as a similar manner in first group. After that the tonsil was excised from the base by electrocautery (Figure, 4).

While, in group three, the rigid laparoscope and the laparoscopic electrocautery was used. Then introduce rigid laparoscope into pharyngeal area, the surgical field was watched on a closed video circuit and colored monitor. By Allis tissue forceps, to retract the edge of crypt caudodorsally and to expose the tonsil, the tonsil was excised from the base by electrocautery.

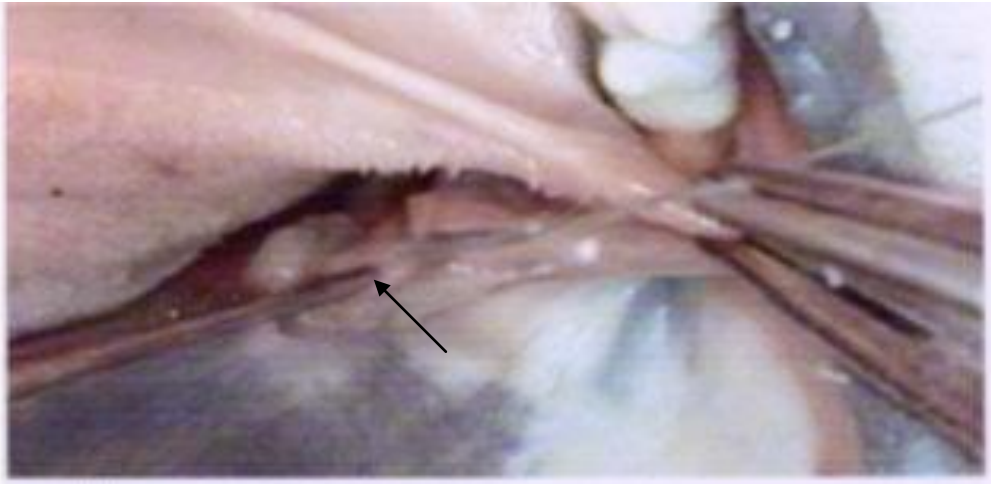
In all groups, following tonsil excision, hemostat was ensured from the site of operation and the oro-pharyngeal site was cleaned to prevent inspiration pneumonia (Figure 5). If bleeding occurs ligation by catgut 2-0 in first group or using electrocautery in second and third groups. After 24 hours of operation soft food and liquid diet was offered for the next three days. Systemic antibiotics penicillin-streptomycin intramuscularly at a dose of 10,000 IU, 20 mg /kg B.W., respectively for four days post operation. Daily animal's observation was recorded such as behaviors, clinical signs or changes which may occur at the period of experiment.



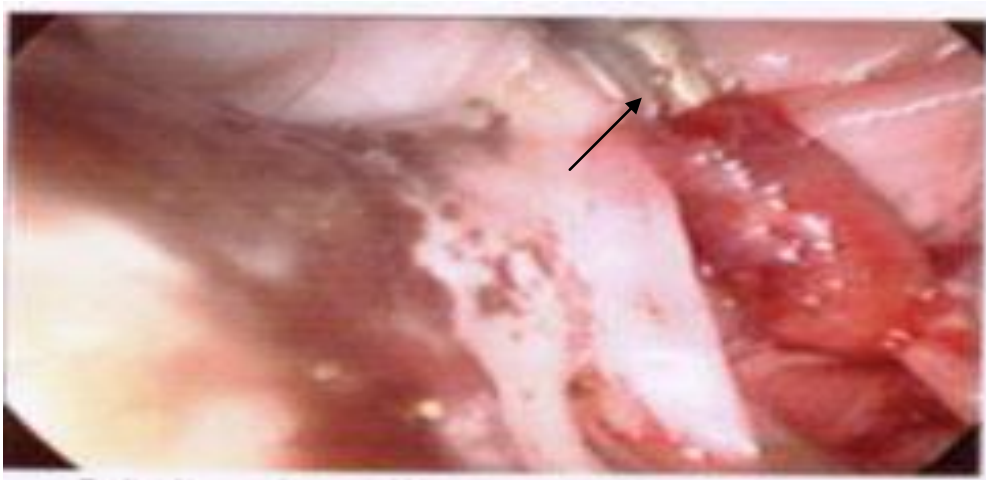
(Figure 1): Shows tonsil on dorsolateral wall of the oropharynx .



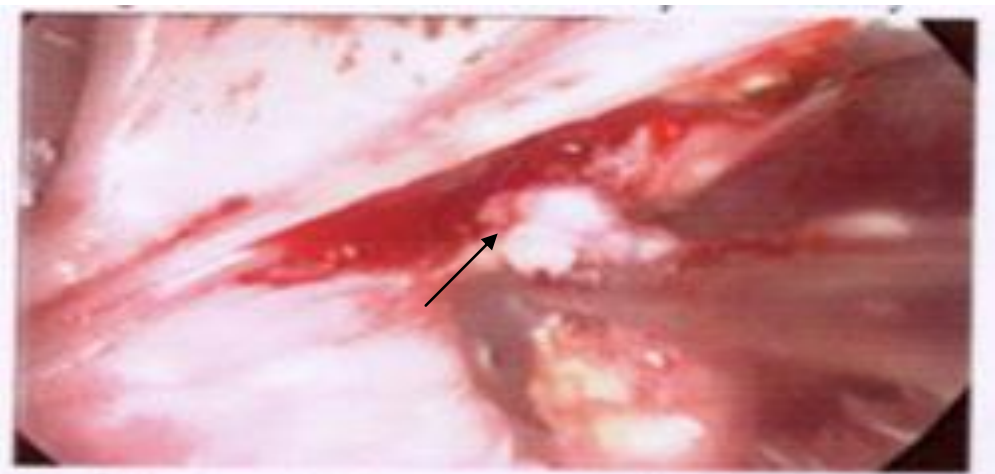
(Figure 2): Shows artery forceps was applied at the base of tonsil.



(Figure 3): Shows application of ligature at the base of tonsil below the artery forceps.



(Figure 4): Shows tonsil resected by electrocautery



(Figure 5): Shows tonsil was resected completely and clean of surgical site.

## **RESULTS**

The results revealed that the appetite of experimental animals decreased post operation, one week later; the appetite became normal. There was no vomiting or dysphagia. In group one, the primary bleeding from the operative site was recorded at one animal, which was controlled by crushing and ligation, while secondary bleeding not observed. After 2 days of operation, the excision sites revealed redness and slight swelling. These signs disappeared after 4-6 days of operation, followed later with white plaque of inflammatory exudates, which covered the excision site. Healing of the surgical sites occurred by 10-12 days after operation. While, in 2nd and 3rd groups, the primary bleeding occurred some times at time of excision but easily stopped by electrocautery. Secondary bleeding was not observed. And after 2 days of operation, the excision sites were revealed redness, slight swelling and burn with dead tissues. These signs were disappeared after 5-7 days of operation and followed later with white plaque of inflammatory exudates which cover the excision site. The healing of the surgical sites was occurred by 11-14 days after operation.

## **DISCUSSION**

Enlargement of tonsils gland, results from chronic tonsillitis, genetic, humeral changes, abscess and tumor, which lead to upper airway obstruction, sever dysphagia, sleep disorder and cardiopulmonary complications. The main indications for tonsillectomy are chronic tonsillitis that is unresponsive to antibiotics, acute tonsillar enlargement causing mechanical interference with swallowing or airflow and neoplasia (12 and 13). The present study indicated that the method used in group one characterized by minor complications, such as minor bleeding at the time of excision in one operation but without secondary bleeding. The minor bleeding may be due to slight looses of ligation at the tonsil base lead to bleeding from the excision sites. While other workers (14), found that more bleeding during abscess tonsillectomy as compared to cold tonsillectomy. The slight inflammation at the excision site and surrounding tissue, which was disappeared after 4-6 days post operation, was suggested to the minor damage of surrounding tissues during operation which were disappeared within short period, in addition to the actions of the systemic antibiotics which may suppressed the post-operative infection. The tonsillectomy bleeding and post-operative inflammation coincide with the observations of other workers (15 and 16). While, the results of 2nd group revealed that, removal of tonsils by electrocautery, causing slight necrosis and mild burns of surrounding tissue. This thermal injury needed a longer healing period, which ranged between 11-14 days, when compared with healing period 10-12 days in first group. This agrees with some surgeon whom excises the tonsils by using electrocautery or laser surgery (2). Other author (17) used an angled endoscopic microdeprider to perform intracapsular tonsillectomy and extracapsular tonsillectomy by standard monopolar cautery technique. The microdebrider tonsillectomy was less painful compared with electrosurgical extracapsular tonsillectomy in children suffering from obstructive tonsillar hypertrophy. In this study, we tried to introduce a modified laparoscopic technique. The tonsillectomy method achieved by laparoscope gave good exposure of surgical field due to the magnification of surgical site to 15 time's its actual size permitting the surgeon to see the anatomical structure in exquisite detail. So we regarded his method of tonsillectomy by using laparoscope may be regarded as a new

technique in this field, but it needs further investigation to exhibit the advantages and disadvantages of this modification method.

In conclusion of this study revealed that ligation of tonsil base, then excision by scalpel as in first group characterized by good healing, in spite of the difficulty in application of ligature. While in 2nd group the excision of tonsils by electrocautery revealed ease of achievement, but healing of surgical site was slightly longer compared to that in the first group. While, rigid laparoscope, which was used for tonsillectomy in group three, provided good exposure to the surgical field, that may add benefits to perform tonsillectomy at narrow space in small patients.

## دراسة مقارنة ثلاث طرائق لاستئصال اللوزتين في الكلاب

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### الخلاصة

أستخدم في هذه الدراسة (11) كلباً قسمت فيها الحيوانات الى ثلاث مجاميع: ففي المجموعة الاولى تم ازالة غدة اللوزتين بواسطة المشروط الجراحي بعد اجراء الربط من قاعدة الغدة؛ اما في المجموعة الثانية فتم ازالة الغدة بواسطة الكي الكهربائي؛ وفي المجموعة الثالثة تم ازالة الغدة باستخدام الة الكي الكهربائي وبمساعدة جهاز الجراحة المنظارية. اظهرت العلامات السريرية بعد يومين من اجراء العملية الجراحية وجود احمرار وتورم في مكان الاستئصال. تلك العلامات اختفت بعد مرور 4-6 ايام من اجراء الاستئصال في المجموعة الاولى و 5-7 ايام في المجموعتين الثانية والثالثة. وحدث الالتئام لمكان العملية بعد 10-12 يوماً في المجموعة الاولى و 11-14 يوماً في المجموعة الثانية والثالثة. ان الاستخدام المحور لجهاز الجراحة المنظارية في المجموعة الثالثة لاستئصال اللوزتين بواسطة الكي الكهربائي قد اعطت نتائج جيدة وذلك لسهولة الطريقة.

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