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LARYNGOTOMY IN DONKEY (With 8 Figs.)

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فتح الحنجرة في الحمير

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تم اجراء فتح طولي في عدد (٢٤) حمار سليم وقسمت هذه الحيوانات التي
مجموعتين كلا منها (١٢) حيوان وأستعملت الخياطة لغلج جروح الحنجرة في المجموعة
الأولي بينما تركت الثانية بدون غلق . تم فحص هذه الحيوانات إكلينيكيًا وكذا
الفحص التشريحي والمجهري بعد إعدام ثلاثة حيوانات من كل مجموعة علي فتحات
(١ ، ٣ ، ٥ ، ٨ أسابيع) لمقارنة الطريقتين . ولقد أظهرت النتائج أن خياطة
جروح الحنجرة أفضل من تركها بدون خياطة لتفادي الكثير من المضاعفات .

SUMMARY

Laryngotomy was performed on 24 normal adult donkeys. The suture closure of the laryngotomy wound was performed in 12 donkeys, while the surgical site was left to heal by second intention in 12 donkeys. All animals were clinically observed. The surgical site examined daily in all animals. Three animals of each group were sacrificed along different periods postoperatively (1, 3, 5 and 8 weeks). Postmortem and histopathological examinations were recorded. The result revealed that suturing of the laryngotomy incision is recommended because it prevent that complications which occure after keeping the laryngotomy incision without suture.

INTRODUCTION

Laryngotomy indicated for many surgical affections of the larynx in domestic animals particularly in equines and canines. Benign tumors, which frequently take the form of pedunculated polyps attached to the epiglottis and vocal cords, can be successfully removed via a laryngotomy (DIETZ and WIESNER, 1984). The laryngotomy is mainly used for

ventriculectomy (TURNER and McILWRAITH, 1982; DIETZ and WIESNER, 1984 and HICKMAN, 1985), Partial resection of the soft palate (BOLES, 1979 and HICKMAN, 1985), partial arytenoidectomy (WHITE and BLAKWELL, 1980 and JENNINGS, 1984), pharyngeal cysts (STICK and BOLES, 1977; KOCK and TATE, 1978 and BOLES, 1979); lymphoid hyperplasia (BOLES, 1979) or epiglottic entrapment (BOLES, 1979 and HICKMAN, 1985). In dogs laryngotomy used for devocalization procedures (KAGAN, 1983). The laryngotomy may also be used as a diagnostic aid in doubtful cases (DIETZ and WIESNER, 1984).

Most authors have recommended second intention healing of the larynx following laryngotomy (BERGE and WESTHUES, 1966; FRANK, 1981; TURNER and McILWRAITH, 1982; VENUGOPLAN, 1982; McILEWRAITH and TURNER, 1987 and SCHNEIDER, 1988).

In the available literature one author (SCHNEIDER, 1974) mentioned that the cricothyroid ligament can be closed with simple continuous pattern.

The present surgical procedures were conducted to study the clinical observations as well as to examine and compare the morphological alterations which occur in the equine larynx in normal donkeys following laryngeal closure with and without suture.

MATERIAL and METHODS

The present work was carried out on 24 clinically healthy adult donkeys. Laryngotomy was performed under effect of chloral hydrate narcosis. The animal was casted into dorsal recumbency with extended head. The skin at the level of the 3rd tracheal ring to 5 cm anterior to the larynx and laterally to the ventral border of the masseter muscles was prepared for aseptic surgery. The triangular depression between the thyroid and cricoid cartilages was identified by palpation before the skin incision was made. A skin incision approximately 8 cm long was made from the level of first tracheal ring to the anterior aspect of the larynx. The cricothyroid notch was palpated and identified. The sternohyoideus muscles were separated on the mid-line with Mayo scissors down to the cricothyroid ligament. The cricothyroid membrane was then incised with stab incision and widened rostrad to the body of the thyroid cartilage and caudad to the middle of the cricoid notch. Then the animals were divided into two main groups.

Group 1: (12 animals)

In this group, the cricothyroid membrane was coaptated with simple continuous suture using synthetic absorbable suture material (coated Vicryl No. 2/0)* with eyeless needle. The two sternohyoideus muscles were coaptated by simple interrupted stitches using the same suture material and the skin was apposed by interrupted horizontal mattress silk suture.

* ETHICON. LTD. U.K. (Polyglaction 910) violet.

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Group 2: (12 animals)

In this group, no sutures were placed in any part of the surgical site. Initial haemostasis was achieved by applying digital pressure. Postoperative care included tetanus prophylaxis and daily cleaning of the incision site with normal saline.

All animals were clinically observed specially for dyspnea and respiratory distress during rest and exercise from the day of operation till the time of sacrifice. The surgical site examined daily in all animals for the presence of oedema, abscesses and fistulation and the observations were recorded. Three animals of each group were sacrificed along different periods of time postoperatively (1, 3, 5 and 8 weeks). Postmortem examination for the presence of adhesions between the larynx and the surrounding structures, haematomas, fistulae, abscesses, suture material, stenosis or ulcer were observed.

The laryngotomy site was excised and the specimens were processed by standard paraffin techniques and stained with hematoxylin and eosin.

RESULTS

All animals of group 1 showed neither cough nor respiratory dyspnea either in rest or in exercise. The swallowing of food was somewhat difficult at the first 3 days. While in group 2, 4 animals from 12 showed respiratory dyspnea at the first 3 days due to aspiration of the edges of the skin wound into the larynx. The swallowing processes were difficult and lasted for three weeks postoperatively.

Slight inflammatory swelling at the seat of operation was observed in group 1, but in group 2, the inflammatory swelling was large and markedly observed along the seat of operation. The swelling was retracted and localized at the ventral aspect of the larynx from the beginning of the second week to take the shape and size of half an orange (Fig. 1). This swelling was subsided gradually and became hard (lemon size) at the beginning of the 3rd week (Fig. 2). The swelling was decreased in size gradually and lasted for the end of the experiment.

All twelve donkeys in group 1, revealed first intention type of healing within 7-10 days postoperatively when the skin sutures were removed. The surgical wounds were closed completely, and the skin appeared to be epithelialized by day 25 in ten of twelve donkeys in group 2. Two donkey's incision site continued without epithelialization for 30 days. All incision sites continued to ooze slightly turbid exudate for two weeks postoperatively.

After sacrifice of the animals, exposure of the larynx revealed a tract contained straw coloured serous like fluid extended from the skin incision to the ventral aspect

of the larynx in group 2 at the first three weeks. In addition, adhesions between the ventral aspect of the larynx and the sternohyoideus muscles were observed till the end of the experiment in the same group specially at the first three weeks postoperatively, while in group 1, relatively no adhesions could be seen.

In group 1 nearly the twelve animals used in this study, normal healing process was observed, from inside, without any gross complications except one animal showed a small elevated haemorrhagic like spot at the third week postoperatively (Fig. 3), otherwise apparently normal laryngeal mucosa were observed till the end of the experiment. While in group 2, unhealed incision was observed 1 week postoperatively in all animals and in two animals 3 weeks postoperatively (Fig. 4).

On microscopic examination of the specimens taken from group 2 which lasted without suture, one week postoperatively, perivascular inflammatory reactions were seen. The latter included oedema and inflammatory cell infiltration.

Three weeks postoperation the process of epithelialization was incomplete and showed necrosis and proliferating epithelium (Fig. 5). On 5 and 8 weeks postoperation the specimens revealed hyperplastic and proliferative epithelial changes (Fig. 6).

In group one the specimens taken from one to three weeks postoperation, the epithelium showed active regenerative process without any inflammatory signs (Fig. 7). In those taken 5 and 8 weeks postoperation only submucosal chronic inflammatory reaction surrounding the suture material was noticed (Fig. 8).

DISCUSSION

In this study laryngotomy was conducted on 24 donkeys. The surgical procedure was performed to compare the obtained results after laryngeal wound management with and without suture.

From our obtained results, advantages of suturing technique after laryngotomy can be summarized as follows:

- 1 - Healing of the laryngotomy wound occurs within 7-10 days by 1st intention.
- 2 - No postoperative complications were recorded.
- 3 - Healing of the laryngeal mucosa occurred within 7 days.
- 4 - Wound management performed at the first 3 days postoperatively and at the time of removal of suture stitches.

On the other hand, keeping of the laryngotomy wound without suturing have may disadvantages which can be summarized as follows:

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- 1 - Delayed healing up to 4th week interfere with the working system of the animal.
- 2 - Swallowing difficulties, which may be, due to the adhesion between the sternohyoid-muscles and the surrounding structures.
- 3 - Healing of the laryngeal mucosa lasted up to 3 weeks (delayed healing susceptible for secondary infection).
- 4 - Daily management of the laryngotomy wound up to 2 weeks (for cleaning the fluid oozing from the skin incision, which may cause scalds at the skin when it is neglected). This result is not agree with SCHNEIDER (1988), who said that such operations need minimal care.
- 5 - Long hospitalization time (up to 4 weeks).
- 6 - Shock may occur due to aspiration of the edges of the skin wound into the larynx (DIETZ and WIESNER, 1984).

From the result of our present study, it should be emphasized that suturing of the laryngotomy wound in donkeys is preferable than keeping it without suture.

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LEGENDS

- Fig. 1:** Showing the seat of laryngotomy, two weeks postoperatively, donkey, group 2, Note, a marked swelling (arrows) around the seat of the operation and unhealed skin incision.
- Fig. 2:** Showing the same animal in Fig. 1, 3 weeks postoperatively; Note, the swelling became small in size (arrows) and the skin incision still unhealed.
- Fig. 3:** Showing larynx with elevated mucosal haemorrhagic spot (the top arrow). Group 1, 3 weeks postoperatively. Note undetectable suture line (the two lower pointer).
- Fig. 4:** Showing larynx with unhealed mucosal incision, Group 2, 3 weeks postoperatively.
- Fig. 5:** Photomicrograph showing incomplete epithelialization associated with epithelial necrosis. Group 2, 3 weeks post laryngotomy. H & E X 250.
- Fig. 6:** Photomicrograph showing hyperplastic proliferative epithelial alteration. Group 2, 5 weeks postlaryngotomy. H & E X 120.
- Fig. 7:** Photomicrograph showing complete epithelial regeneration. Group 1, 3 weeks postoperatively. H & E X 120.
- Fig. 8:** Photomicrograph showing laryngeal submucosa with chronic inflammatory reaction surrounding the suture material Group 1, 5 weeks postoperatively.

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