Retropharyngeal lymph node infection in horses: 46 cases (1977-1992)

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SUMMARY: A retrospective study of 46 horses with retropharyngeal lymph node (RPLN) infection presented to the Rural Veterinary Centre between 1977 and 1992 was undertaken. Horses aged less than one year were most commonly represented (46%). Thirty-nine percent of cases had been exposed to horses with confirmed or suspected strangles (Streptococcus equi subsp equi infection) within the previous 8 weeks. Most frequent signs were unilateral or bilateral swelling of the throat region (65%), respiratory stertor/dyspnoea (35%), purulent nasal discharge (20%), inappetence and signs of depression (15%), and dysphagia (9%). All horses had a soft tissue density in the retropharyngeal region on radiographs. Rhinopharyngoscopy, ultrasonography, haematology as well as cytological and microbial analysis of material aspirated from the soft tissue swelling facilitated diagnosis in some horses.

Fifteen horses (33%) were treated with procaine penicillin intramuscularly for 4 to 7 days followed by oral trimethoprim-sulphadimidine for 7 to 14 days. Non-steroidal anti-inflammatory drugs were administered to 6 horses. Four required tracheostomy for severe respiratory distress. The 15 horses treated medically responded to treatment and were discharged from hospital. Three horses (6%) with mild signs received no treatment and recovered uneventfully.

Twenty-eight horses (61%) underwent general anaesthesia and surgical drainage of a RPLN abscess. Nineteen received procaine penicillin G for 4 to 7 days. Four of the nine horses that did not receive antibiotic treatment after surgery required further surgical drainage 10 days to 7 weeks after the initial surgery.

Limited follow-up information was available for 37 horses. Thirty-two horses were considered to have made complete recovery, 3 horses had died through misadventure and 2 had been euthanased because of chronic ill-thrift.

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Introduction

The retropharyngeal lymphocentre is comprised of lateral and medial chains of lymph nodes. It receives afferent lymph vessels from the upper respiratory and gastrointestinal tracts, ears and skin of the parotid region, muscles of the face and neck, sublingual, mandibular and parotid salivary glands, and the parotid and mandibular lymphocentres (Saa and Getty 1975).

Lymphadenitis and/or abscessation of the retropharyngeal lymph nodes (RPLN) of the horse most often occurs in association with upper respiratory tract infections, particularly those caused by Streptococcus equi subsp equi (McAllister 1982). On rare occasions it may be secondary to pharyngeal trauma (McAllister 1982; Todhunter et al 1985). Affected horses frequently have enlarged, painful nodes, which may be palpable in the region of Viborg’s triangle (Todhunter et al 1985; De Lahunta and Habel 1986). Other clinical signs of retropharyngeal (RP) infection may include pyrexia, inappetence, nasal discharge, dyspnoea and dysphagia (McAllister 1982).

The presence of a RP mass can be diagnosed on clinical and radiographic findings, with the assistance of endoscopy and ultrasonography when available. These diagnostic procedures are also useful for assessing response to therapy. Abscessation may be differentiated from other causes of lymph node enlargement on the basis of historical findings (for example, known or suspected exposure to horses infected with S equi subsp equi) and cytological and microbial analysis of material aspirated percutaneously from the soft tissue swelling. A haemogram also may provide evidence of a pyogenic infection.

The purpose of this study was to: i) establish criteria for determining the most effective method for treating RPLN infections, that is, medical versus surgical management, and ii) determine the long-term outcome in horses after RPLN infection.

Materials and Methods

Horses in this study were presented to the Rural Veterinary Centre (RVC), University of Sydney, Camden, between January 1977 and August 1992 with signs of RPLN infection. In all horses, a complete physical examination was performed with attention being focused on the upper respiratory tract. In some horses, rhinopharyngoscopy was performed using a flexible fibrescope, and haematological and plasma biochemical values were measured using routine laboratory procedures. In all horses lateral radiographs of the pharyngeal region were taken, either with the horse standing or in lateral recumbency after induction of general anaesthesia. A retropharyngeal mass was confirmed by the presence of one or more of the following: 1) soft tissue density in the retropharyngeal area; 2) thickening of the roof of the pharynx; 3) reduction in the diameter of the pharyngeal airway; and 4) distortion of the guttural pouch outlines. Mild pharyngeal airway narrowing was considered to have
occurred when there was less than about 33% reduction in airway diameter. Moderate and severe narrowing were considered to have occurred when there was an estimated 33 to 66% and greater than 66% reduction in airway diameter, respectively. Similarly, mild thickening of the roof of the pharynx was considered to have occurred when the tissue was thickened by less than about 50%. Moderate and severe thickening was considered to have occurred when this tissue was 50 to 100% and greater than 100% thicker than what was considered normal. Horses examined after February 1989 usually presented for veterinary attention because of unilateral or bilateral swelling of the throat area. Follow-up information was obtained by a telephone survey conducted in May 1990. Mild narrowing was considered to have occurred when airway diameter was 15 (35%) horses, moderate airway narrowing in 15 (33%) and severe narrowing in 6 (14%) horses. Airway diameter could not be assessed in 13 (28%) horses, which were radiographed under general anaesthesia, as the endotracheal tube maintained patency of the pharyngeal airway in these horses. Mild, moderate or severe thickening of the roof of the pharynx was a feature in 12 (26%), 14 (30%) and 5 (11%) of the horses, respectively. A fluid line was present in one or both gullet pouch openings was consistent with gullet pouch empyema.

In all horses there was radiographic evidence of a soft tissue density in the retropharyngeal area (Figure 1) causing a reduction in the pharyngeal lumen. The soft tissue density caused distortion and cranioventral displacement of the caudoventral border of one or both gullet pouches, producing a smooth, concave outline in 24 (52%) horses. There was a mild reduction in pharyngeal airway diameter in 15 (35%) horses, moderate airway narrowing in 15 (33%) and severe narrowing in 6 (14%) horses. Airway diameter could not be assessed in 13 (28%) horses, which were radiographed under general anaesthesia, as the endotracheal tube maintained patency of the pharyngeal airway in these horses. Mild, moderate or severe thickening of the roof of the pharynx was a feature in 12 (26%), 14 (30%) and 5 (11%) of the horses, respectively. A fluid line was present in one or both gullet pouches of 5 (11%) horses that had GPE in addition to RPLN enlargement.

Haematological and biochemical data were recorded for 8 horses. Leucocytosis with a marked neutrophilia was present in 7 horses, with total nucleated cell counts of up to 23.2 x 10^9 cells/L. This was typically followed by the appearance of band neutrophils, and a marked lymphocytosis. Seven horses were anaemic (mean packed cell volume 0.32 L/L). Hyperfibrinogenaemia was present in 2 horses, with values of 7 and 8 g/L recorded. Samples obtained from RP masses of 14 horses were submitted for bacterial culture. In 13, S. equi subsp. equi was isolated in pure culture. In the remaining sample, from a horse suffering wire cuts to the throat and jaw region, a mixed growth of gram negative and gram positive cocoid forms was cultured. In those horses from which samples for bacteriological investigation were not obtained, a presumptive diagnosis of S. equi subsp. equi infection was made on the basis of the history and physical examination. Three horses with mild RP abscessation received no treatment, and were not hospitalised. Fifteen horses were admitted to hospital and treated medically. These horses had mild to moderate swelling in the RP region, mild narrowing of the pharyngeal airway or the owners were not prepared to pay costs of surgical drainage. All horses in this group were given procaine penicillin G intramuscularly at 20 000 IU/kg every 12 h for 7 days. This was followed, usually after discharge from hospital, by oral trimethoprim-sulphadimidine at 15-20 mg/kg every 12 h for 1 to 2

### Table 1

<table>
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<tr>
<th>Age (yr)</th>
<th>Female</th>
<th>Male</th>
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<td>7</td>
<td>5</td>
<td>-</td>
<td>12</td>
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<tr>
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<td>6</td>
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<tr>
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### Table 2

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<td>unilateral</td>
<td>12</td>
</tr>
<tr>
<td>Contact with strangles</td>
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<tr>
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</tr>
<tr>
<td>Purulent nasal discharge</td>
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<tr>
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<tr>
<td>Inappetence</td>
<td>7</td>
</tr>
<tr>
<td>Dysphagia</td>
<td>4</td>
</tr>
<tr>
<td>Trauma to throat region</td>
<td>1</td>
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</table>

Table 1: Age and sex of 46 horses with retropharyngeal lymph node infection

Table 2: History and presenting complaints in 46 horses with retropharyngeal lymph node infection

Results

Case records from 46 horses were included in the survey. The age and sex of horses are shown in Table 1. Twenty-one (46%) were less than one year, of which 20 were Standardbred. Eleven foals from a Standardbred breeding farm were presented for veterinary attention in January and February 1985. A further 4 foals from this farm were presented in February and March 1987. The remainder of the horses in the study were 1 to 2 years old (n = 12; 26%), or more than 2 years (n = 13; 26%) and were of mixed breeds. A summary of pertinent historical and clinical findings is presented in Table 2. Horses were usually presented for veterinary attention because of unilateral or bilateral swelling of the throat area (65%) and a history consistent with an upper respiratory tract infection 1 to 3 weeks before presentation. Eighteen horses (39%) had been in contact with horses known or suspected to be suffering from strangles in the 8 weeks before presentation.

Other signs prompting owners to seek veterinary attention for their horses included: respiratory stertor and dyspnoea (35%), purulent nasal discharge (20%), inappetence and signs of depression (15%) and dysphagia (9%) (manifest as excessive salivation and difficulty swallowing). Two horses had been treated for gullet pouch empyema (GPE) one week before presentation for RPLN abscessation. Another horse had sustained trauma medial to the angle of the mandible five days previously.

Findings on physical examination included visible swelling in the region of Viborg's triangle (65%) and pain on palpation of the swollen area (15%). Increased rectal temperature, heart rate or respiratory rate were reported in 37 horses. Sixteen horses (35%) had dyspnoea or respiratory stertor at presentation. This was usually less than about 50%. Moderate and severe narrowing were considered to have occurred when there was an estimated 33 to 66% and greater than 66% reduction in airway diameter. Mild, moderate or severe thickening of the roof of the pharynx was considered to have occurred when the tissue was thickened by less than about 50%. Moderate and severe thickening was considered to have occurred when this tissue was 50 to 100% and greater than 100% thicker than what was considered normal. Horses examined after February 1989 usually presented for veterinary attention because of unilateral or bilateral swelling of the throat area. Follow-up information was obtained by a telephone survey conducted in May 1990. Mild narrowing was considered to have occurred when airway diameter was 15 (35%) horses, moderate airway narrowing in 15 (33%) and severe narrowing in 6 (14%) horses. Airway diameter could not be assessed in 13 (28%) horses, which were radiographed under general anaesthesia, as the endotracheal tube maintained patency of the pharyngeal airway in these horses. Mild, moderate or severe thickening of the roof of the pharynx was a feature in 12 (26%), 14 (30%) and 5 (11%) of the horses, respectively. A fluid line was present in one or both gullet pouch openings was consistent with gullet pouch empyema.

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weeks. In 6 horses phenylbutazone was given intravenously at 4.4 mg/kg once, followed by oral dosing (4.4 mg/kg every 24 hours for 2 days followed by 2.2 mg/kg every 24 h for 3 to 5 days). One horse with dysphagia was given intravenous fluids (12 L). There was usually a reduction of RP swelling leading to marked clinical improvement 24 to 48 h after starting treatment, and recovery generally proceeded without complication. The average length of hospitalisation for horses treated medically was 7 days (range 3 to 12 days).

In the group that was treated surgically, a tracheostomy was done in 4 horses with severe breathing difficulty. This resulted in immediate improvement, while the antibiotic and anti-inflammatory therapy helped diminish the size of the RP mass. Tracheostomy tubes (22-33 mm external diameter) were maintained until horses were able to breathe without difficulty after tube removal, usually after 3 to 4 days. The tubes and tracheostomy sites were cleaned daily.

The remaining 28 horses had large, cavitating RP masses or severe airway narrowing and were treated surgically. General anaesthesia was induced and endotracheal intubation performed via tracheostomy in 2 horses. With the horses in lateral recumbency and with the head and neck fully extended a surgical approach similar to that for prostatic laryngoplasty was used. A skin incision (=15 cm) was made parallel and slightly ventral to the linguofacial vein extending from the cranial aspect of the larynx to the level of the first tracheal ring. Blunt dissection was performed in a craniodorsal direction until the wall of the abscessed mass was identified. In most horses, the enlarged RPLN were readily located ventral and medial to the guttural pouches. After aspirating from the mass to positively identify the abscess cavity and obtain a sample for bacteriological analysis in selected horses, the area was packed off with moistened sterile laparotomy sponges, the abscess cavity penetrated with Metzenbaum scissors and the contents drained. The cavity was flushed with copious amounts of sterile saline solution and a silastic drain inserted with its distal end protruding ventrally. The wound was left to heal by second intention.

After surgery, the wound and abscess cavity were flushed twice daily for several days with povidone iodine diluted with either sterile saline or warm water. Silastic drains were removed after 2 to 4 days. To prevent serum scalding, petroleum jelly was applied to the skin surrounding the wound twice daily. Nineteen horses were given procaine penicillin (20 000 IU/kg every 12 h) for 4 to 7 days after surgery. The average duration of hospitalisation for horses treated surgically was 5 days (range 2 to 12 days).

In the 5 horses where concurrent guttural pouch empyema was present, a modified Whitehouse approach was used, which allowed access to both guttural pouches and facilitated ventral drainage (Freeman 1991). After draining, the pouch was flushed with sterile saline. After surgery, wounds and pouches were treated as described above. After surgical drainage, there was rapid resolution of the respiratory difficulty and RP swelling in all but 4 horses. Three of these horses returned to hospital for further drainage 10 to 14 days after the initial surgery; one foal returned 7 weeks later. None of these horses had received penicillin after the initial surgery and in each case there was substantial fibrous tissue reaction in association with the reformed RP abscess.

Follow-up information was obtained for 37 horses. Of these 32 were considered to have made a complete recovery by 4-5 months after the RPLN infection. During this period 2 of the 32 horses developed limb swellings diagnosed as purpura haemorrhagica by a local veterinarian. In both cases treatment with parenteral glucocorticosteroids and procaine penicillin G resulted in resolution of signs. A third horse developed a large periobital abscess. This was drained and healing was uneventful. Of the remaining 5 horses, 3 died of misadventure; 1 was found dead in the paddock, 1 had small intestinal volvulus and was euthanased; and 1 suffered evagination after castration and was euthanased. Two horses suffered ill thrift for more than 6 months after the RPLN infection and were euthanased. Necropsy in 1 horse revealed a large mesenteric abscess suspected to be due S equi subsp equi. A necropsy was not performed on the other horse.

**Discussion**

In horses in the present study the presence of a RP mass resulted in one or more of the following clinical signs: swelling in the retropharyngeal region; stertorous respiration due to partial obstruction of the pharyngeal airway; dysphagia due to disturbances in motor function of the pharynx; nasal discharge due to upper respiratory tract infection or guttural pouch involvement. Pyrexia and inappetence commonly accompanied these signs.
Differentiation between retropharyngeal abscessation, lymphadenitis, cellulitis, neoplasia and haematoma depended largely on the history, for example, known or suspected exposure to horses infected with *S. equi* subsp *equi*; prior traumatic passage of a nasogastric tube; administration of antimicrobial drugs; age of the horse; duration and nature of accompanying nasal discharge (if present); and on cyto logical and microbiological analysis of material aspirated percutane ously from the soft tissue swelling. The radiographic appearance of a gas-fluid interface within the RP mass, a finding consistent with cavitary abscessation, was only occasionally observed in these horses. This supports the observations of Todhunter *et al.* (1985). Radiographic evidence of distortion and ventral displacement of the roof of the pharynx was common. Ultrasonographic detection of one or more fluid-filled cavities has recently become a useful method for differenti ating abscesses from other causes of RP swelling (Todhunter *et al.* 1985). Discharge from the guttural pouch openings was occasion ally observed and was consistent with GPE.

In addition to RPLN abscessation several of the horses in the present study developed other complications in association with *S. equi* subsp *equi* infection. These included GPE, purpura haemorrhagica, periorbital abscessation and mesenteric abscessation. This supports the findings of Sweeney *et al.* (1987) who reported about 20% of horses on a large breeding farm showing clinical signs of infection with *S. equi* subsp *equi* subsequently developing similar complications. Anemia was a feature in 7 of the 8 horses in which haematology was performed. Timoney (1993) suggested that when anemia occurs in the acute stages of the disease it may be the result of in-vivo haemolysis associated with streptolysin O released by the *S. equi* subsp *equi*. Alternatively he suggested that when anemia occurred after a more chronic course of strangles, as was the case in most of the horses in this study, it is more likely due to an immune-mediated mechanism leading to premature removal of erythrocytes from the circulation (Timoney 1993).

Two treatment regimens were used for RPLN infection. Medical management, involving systemic administration of appropriate anti microbial agents in sufficient doses for an adequate period, usually more than 10 days, was an effective therapy for lymphadenitis and immature abscesses. However, in horses with thick-walled abscesses surgery was the treatment of choice, because it was unlikely that antibiotic therapy alone would have allowed resolution of the lesions. The inherent risks associated with anaesthesia and undertaking surgery in a site surrounded by vital structures should not be overlook ed. Antibiotic therapy should be given in association with surgical drainage to avoid recrudescence of the abscess as occurred in 4 of the 9 horses in this study, which did not receive antibiotics after surgery.

One of the disadvantages of medical management is the need for long-term antibiotic administration and its associated drawbacks, such as muscle soreness, imbalances in normal intestinal flora, poor compliance by owners and cost. In horses where infection is due to *S. equi* subsp *equi*, the antibiotic of choice is procaine penicillin G, although most isolates are also sensitive to a range of other antibiot ics, including trimethoprim-sulphonamide combinations. Procaine penicillin G at 22 000 IU/kg intramuscularly every 12 h until all clinical signs have been absent for 5 days has been recommended for strangles (Jorm 1993), while 20 000 IU/kg intramuscularly every 12 h for 2 weeks followed by 40 000 IU/kg intramuscularly every 24 h for 2 weeks has been suggested for intra-abdominal abscessation (Becht 1993). A shorter course of penicillin G (for example, 5 to 7 days) may be followed with an oral trimethoprim-sulphonamide preparation (15-20 mg/kg orally every 12 h) for 2 weeks or longer to avoid muscle soreness due to repeated intramuscular injections and also for ease of administration by the owner.

Phenylbutazone was beneficial when used in conjunction with antibiotic therapy to reduce pharyngeal swelling and pain enabling the horse to breathe more easily and to eat and drink more comfortably. It is also indicated after surgical drainage to minimise post operative swelling and inflammation.

On the basis of limited follow-up information obtained for horses in this study we suggest that the regimens described allow resolution of RPLN lymphadenitis/abscessation in most horses, particularly if the infection is due to *S. equi* subsp *equi*.

References

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**Dystocia in the cat**

In a retrospective study of 155 cases of feline dystocia presented to the Bagarmossen Veterinary Hospital in Stockholm, Sweden, Ekstrand C and Linde-Forsberg C (1994) *J Small Anim Pract* 35:459-464, found that 67.1% were of maternal origin, mainly caused by uterine inertia, while 29.7% were of foetal origin, mainly resulting from malpresentations/malorientations and deformities. Its breed incidence was somewhat higher in Persian cats than in other breeds and considerably lower in Norwegian forest cats. Litter size was not related to the risk of developing dystocia. Ninety-seven cats (62.5%) were treated with calcium and, or, oxytocin. Medical treatment was successful in only 29 cases (29.9%). Caesarean sections were performed on 123 (79.4%) of the cats that were brought to the hospital because of dystocia. In 55 cases (35.5%) a caesarean section was performed without prior attempts at medical treatment.