Muscle separation approach to scapular neck fractures in eight dogs

W. T. McCartney1; C. B. Garvan2

1Marie Louise Veterinary Hospital, Baldoyle, Dublin, Republic of Ireland;
2Dublin Institute of Technology, Dublin, Republic of Ireland

Summary

Objectives: To report on a new surgical approach to scapular neck fractures. Methods: A combined prospective and retrospective study of eight dogs that had sustained a fracture of the scapular neck between 1992 and 2005 was performed. All eight dogs had an internal fixation using a T plate through a muscle separation approach. Retraction of the supraspinatus from the deltoideus and infraspinatus allows an adequate surgical window to enable plating of the scapular neck. Results: Sixty-two percent had an excellent outcome without any lameness or stiffness detected. The remaining cases experienced infrequent bouts of stiffness, or, in one case lameness. Clinical significance: The current literature recommends that the surgical approach to the scapular neck is by osteotomy of the acromion process, which is unnecessary in the authors’ opinion as it increases surgical trauma, operating time and the number of implants required.

Keywords
Scapula, neck, fracture, dog

Introduction

Fracture of the scapular neck is uncommon with an incidence of 2.4% (1), and open reduction is the treatment of choice (2). The recommended approach for fracture fixation is a craniolateral approach with osteotomy of the acromion process (3). There is a high incidence of thoracic trauma with fractures of the scapula (4, 5). A significant proportion of dogs that sustain an articular fracture of the scapula develop long-term clinical symptoms of post traumatic osteoarthritis (6).

Methods and results

Eight dogs were admitted with scapular neck fractures from 1992 to 2005 and were all treated using a craniolateral muscle separation approach, with plate fixation. All of the dogs received a preoperative protocol of antibiotics and analgesics, of which these were combinations of cephalosporins, nonsteroidal antiinflammatories and opiates. Following incision in the cranial fascial insertions to the distal scapular spine and the deep brachial fascia, the omotransversarius was incised and retracted in order to expose the supraspinatus and the acromial part of the deltoideus muscle. The supraspinatus was then elevated off the cranial aspect of the scapula spine and body. Using self retaining retractors, the acromial part of the deltoideus and infraspinatus were retracted caudally and the supraspinatus cranially in order to expose the distal scapula. Periosteal elevation of any remaining soft tissue was performed to expose the entire scapular neck whilst isolating the suprascapular nerve. A T plate was slid under the suprascapular nerve and the two distal screws were inserted following drilling and tapping. The plate was then used to manoeuvre the distal fragment in order to reduce the fracture, and the proximal screws were then inserted. The screw sizes used were either 2 mm or 2.7 mm in diam-
Routine closure was performed and postoperative antibiotics and analgesics were administered for four and seven days, respectively. The dogs were restricted to a small room for eight weeks and passive flexion and extension of the shoulder was performed by the owners three or four times daily. Postoperative check-ups were carried out at three days, two weeks, 12 weeks, and long-term check-up took place between six months and two years by the original surgeon.

Four of the dogs were Terriers, six were aged three years or less, and three were males (Table 1). Five cases had 2 mm screws and plates, and three had the 2.7 mm size. Screw loosening was evident in two dogs radiographically at final check-up, but it was not a clinical problem. The outcomes were classified as being ‘excellent’ if they did not have any clinical problems; ‘very good’ if they had infrequent bouts of stiffness; and ‘good’ if they had infrequent bouts of stiffness and lameness. Five of the cases had an ‘excellent’ outcome, whilst two had ‘very good’ outcomes, and one had a ‘good’ outcome.

Discussion

Fracture of the scapular neck usually involves significant instability and displacement (Figs. 1 and 2). Orthogonal views of the shoulder are required in order to fully assess the fracture. Since the scapula has an excellent source of possible extraosseous blood supply from surrounding musculature, conservative treatment is often a successful method in order to treat scapular fractures (7). Conservative treatment of scapular fractures can be associated with a long recovery and residual lameness. The fractures of the scapula that require internal fixation are those that are intra-articular, unstable extra-articular, and stable extra-articular fractures which involve significant malalignment of the glenoid cavity (8). Fractures of the scapular neck can be extra-articular, but the internal fixation requires peri-articular implants to enable fixation distally, so the joint will suffer some trauma from the injury and surgery. Perhaps the difference between the outcome of an intra-articular fracture and a scapular neck fracture is a reflection of this difference in the degree of trauma and subsequent post-traumatic osteoarthritis, as there was overall an excellent long-term outcome in this case series, compared to a previous report (6). The surgical approach is hampered by the presence of the acromion process and the acromial part of the deltoideus. Osteotomy of the acromion process has been the recommended approach, but this involves increased surgical trauma, prolonged operating time, and the insertion of extra implants. The results of this small case series indicates that the craniolateral muscle separation approach (Fig. 4) is a successful technique, and in comparison to the acromion process osteotomy technique it reduces operating time and surgical trauma. This is the first report of treating scapular neck fractures using this approach as far as the authors are aware.

Acknowledgements

The authors would like to thank the veterinary surgeons who referred the cases.

Table 1 Case details.

<table>
<thead>
<tr>
<th>Breed</th>
<th>Age</th>
<th>Sex</th>
<th>Weight</th>
<th>Implant</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>JRT</td>
<td>8 months</td>
<td>F</td>
<td>8 kg</td>
<td>2 mm</td>
<td>Very good</td>
</tr>
<tr>
<td>JRT</td>
<td>1 year</td>
<td>F</td>
<td>14 kg</td>
<td>2.7 mm</td>
<td>Excellent</td>
</tr>
<tr>
<td>Crossbreed</td>
<td>7 years</td>
<td>F</td>
<td>7 kg</td>
<td>2 mm</td>
<td>Excellent</td>
</tr>
<tr>
<td>Crossbreed</td>
<td>1.5 years</td>
<td>M</td>
<td>9 kg</td>
<td>2 mm</td>
<td>Excellent</td>
</tr>
<tr>
<td>Labrador</td>
<td>2.5 years</td>
<td>F</td>
<td>35 kg</td>
<td>2.7 mm</td>
<td>Good</td>
</tr>
<tr>
<td>Bichon</td>
<td>7 years</td>
<td>M</td>
<td>7 kg</td>
<td>2 mm</td>
<td>Excellent</td>
</tr>
<tr>
<td>Boxer</td>
<td>6 months</td>
<td>F</td>
<td>12 kg</td>
<td>2 mm</td>
<td>Excellent</td>
</tr>
<tr>
<td>SBT</td>
<td>10 months</td>
<td>M</td>
<td>24 kg</td>
<td>2.7 mm</td>
<td>Very good</td>
</tr>
</tbody>
</table>

JRT: Jack Russell Terrier; SBT: Staffordshire Bull Terrier; Outcomes: Excellent: No lameness or stiffness; Very good: Infrequent stiffness; Good: Infrequent stiffness and lameness.
References


