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Treatment of a coxofemoral luxation secondary to upward fixation of the patella in a Shetland pony

P. D. Clegg, R. J. Butson

Veterinary Record (1996) **138**, 134-137

A nine-year-old Shetland pony gelding, with a history of recurrent upward fixation of the patella, suddenly developed severe lameness in its right hindlimb. A luxation of the coxofemoral joint was diagnosed by a clinical and radiographic examination. The initial treatment of the luxation by closed reduction was not maintained, and the limb was placed in an Ehmer sling for four days after a second closed reduction. This allowed the femoral head to remain in the acetabulum, although a persistent subluxation remained, presumably owing to a rupture of the round ligament. The pony remained comfortable at pasture for over two years after the reduction, until osteoarthritis of the coxofemoral joint caused it to become severely lame and it had to be euthanased.

COXOFEMORAL luxation is a relatively rare cause of lameness in horses and ponies, although it has been reported to occur in association with upward fixation of the patella (Bennett and others 1977). This case report describes the diagnosis, management and outcome of a coxofemoral luxation in a mature Shetland pony. The luxation was treated by closed reduction under general anaesthesia, followed by immobilisation of the limb in an Ehmer sling. The upward fixation of the patella was treated by desmotomy of the medial patellar ligament. The pony improved and was comfortable at pasture for two years, before it became lame again as a result of severe osteoarthritis of the coxofemoral joint and had to be euthanased.

Case history

A nine-year-old Shetland pony gelding, used for driving, had been in its owners' possession for two years. They reported no previous lameness problems other than intermittent upward fixation of the patella. Their veterinary surgeon had advised against surgical treatment for this condition, unless it became a major problem. In the two weeks before the pony became severely lame, the frequency of the condition had increased to the point that the right hindlimb was frequently caught in extension, and the release of the patella was becoming increasingly difficult. Four days before its referral the pony was discovered at pasture, in considerable distress and not bearing weight on the right hindlimb. A veterinary examination failed to reveal the cause of the lameness, and analgesic therapy with 0.5 g phenylbutazone (Equipalazone; Arnolds) orally twice a day had no effect on the lameness.

Clinical examination

The pony was bright and did not appear to be particularly distressed. However, it was 9/10 lame on the right hindlimb and only intermittently touched its toe on the ground. Flexion of the right hindlimb was fiercely resisted, as was abduction of the femur. The whole right hindlimb appeared to be shorter than the left

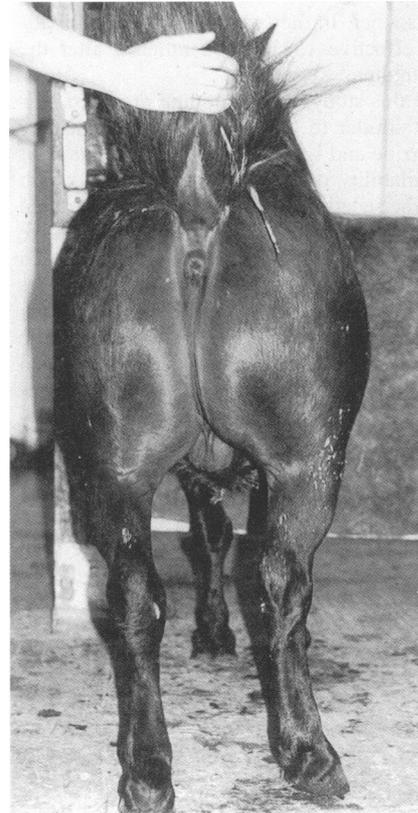


FIG 1: The pony when first examined, showing the outward rotation and the shortening of the right limb characteristic of coxofemoral luxation

hindlimb, with the point of the os calcis on the right hindlimb being 2 to 3 cm higher than that on the left. The right limb appeared to be rotated outwards, with the stifle and foot pointing laterally, about 20 degrees away from the sagittal plain, and the hock being rotated medially to a similar degree (Fig 1).

Radiography

The pelvis was radiographed while the pony was standing (May and others 1991); it was sedated with 1.5 mg detomidine (Domosedan; SmithKline Animal Health) intravenously. In order to position the head of the X-ray machine under such a small pony, its front legs were raised on a stand. The head of the machine was placed underneath the pony and a ventrocranial-dorsocaudal oblique radiograph of the acetabuli of the pelvis was taken. A gridded cassette was held in a plate-holder perpendicular to the primary beam. The radiographs revealed a cranial luxation of the right coxofemoral joint. No associated fracture could be identified.

Treatment

Before surgery the pony was starved overnight. It was given 3000 iu tetanus antitoxin (Tetanus antitoxin; C-Vet) and 2 Mu procaine penicillin (Duphapan; Solvay Duphar). After premedication with 5 mg acepromazine (Berkace; BK Veterinary Products), general anaesthesia was induced with 1.7 mg detomidine followed by 340 mg of ketamine (Vetalar; Parke Davis). The pony was intubated and maintained with a mixture of halothane and oxygen administered through a circle system.

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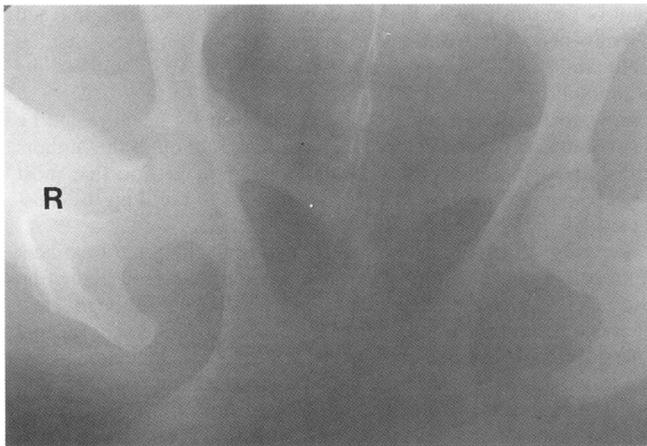


FIG 2: Ventrodorsal radiograph of the pelvic region of the pony taken under general anaesthesia before reduction of the luxation of the right coxofemoral joint

The pony was initially placed in dorsal recumbency and a ventrodorsal radiograph of the pelvis was taken which confirmed the diagnosis (Fig 2). It was then placed in left lateral recumbency and a rope was passed between its hindlimbs, underneath it cranially, and around the perineal region and over the right gluteal muscles caudally. The rope was tied to the surgery table, and towels were used to pad it where it ran around the pony. A second rope was placed around the distal right hindlimb, and traction was applied to this limb at an angle of about 110° from the long axis of the body. The manipulation of the greater trochanter and the stifle in a lateromedial direction allowed the luxation to be reduced after several minutes of sustained traction. A ventrodorsal radiograph of the pelvis confirmed the reduction. The pony was then placed in right lateral recumbency and a desmotomy was performed on the medial patellar ligament of the right hindlimb (Turner and McIlwraith 1989). The pony was allowed to recover while being assisted manually, but during the recovery the coxofemoral joint relaxed.

Next morning the pony was reanaesthetised and the luxation reduced with relative ease in the same way. An attempt was made to immobilise the coxofemoral joint partially by placing the limb in an Ehmer sling. The right hindlimb was strapped up in flexion by placing elastoplast in a figure of eight pattern around the tibia, metatarsus and femur over a cotton wool bandage. The bandaging was taken around the body in order to prevent it from slipping. The pony was allowed to recover from the anaesthesia as before and regained its feet with relative ease. Initially it appeared to cope with the Ehmer sling, and was able to walk satisfactorily on three legs (Fig 3).

Postoperative management

The pony was given 0.5 g of phenylbutazone orally every other evening. In the first 24 hours after the operation, it was very distressed and made repeated attempts to remove the sling. Sedation with 7.5 mg acepromazine administered intramuscularly had no effect on the pony's distress, but the administration of 5 mg romifidine (Sedivet; Boehringer Ingelheim) intramuscularly calmed it down for several hours. The same dose of romifidine was administered twice more at intervals of six hours. There was some concern that the Ehmer sling was occluding the circulation to the distal limb, but a digital pulse was just palpable at the level of the proximal sesamoid bones. After the first 24 hours the pony became much happier with the sling, ate well, and was able to get up and down with relative ease on three legs.

The sling was removed four days after the operation, and the coxofemoral joint appeared to be still in position. After the removal of the sling, the whole right hindlimb became very oedematous and the pony spent a lot of the time with the limb held up, but it was well able to bear its weight on the limb when it was



FIG 3: The pony after the reduction of the coxofemoral luxation and immobilisation of the limb in an Ehmer sling

walked. The pony was strictly box rested for one week after the sling was removed, and then began to walk short distances 'in hand' from the box. The sutures were removed from the medial patellar desmotomy 10 days after the operation. The pony was discharged two weeks after the operation, with instructions to box rest it for one month with gradually increasing amounts of controlled walking exercise over that period. The treatment with phenylbutazone was withdrawn when the pony was discharged.

The pony was re-examined 46 days after the reduction of the luxation, when it was found at the walk and 2/10 lame on the right hindlimb at the trot. Its limb carriage was normal. Flexion of the limb was not resisted, and a flexion test had no effect on the lameness. There was slight skin damage, with scab formation over a small area of the proximal plantar metatarsus, which was considered to be due to local skin ischaemia as a result of the Ehmer

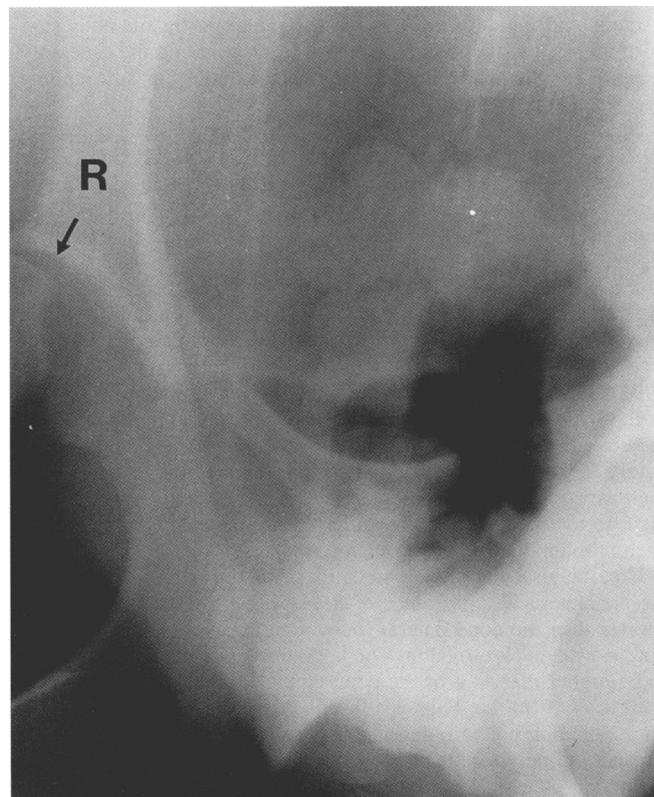


FIG 4: Standing pelvic ventrocranial-dorsocaudal oblique radiograph of the coxofemoral region of the pony 80 days after the reduction of the luxation. There is mild subluxation of the right coxofemoral joint (R), but there is no radiographic evidence of degenerative joint disease



sling. The left hindlimb kept being caught in extension owing to upward fixation of the patella.

The pony was next seen 80 days after the luxation had been reduced. At that stage the owners reported the pony to be sound on the right hind, although it continued to have problems with the upward fixation of the patella in the left hind. The pony was sound at the walk and 1/10 lame at the trot on the right hind. The skin had healed over the right metatarsus. An assessment of gait was made difficult by the continual upward fixation of the patella on the left hind. Ventrocranial-dorsocaudal oblique radiographs of the pelvis revealed no evidence of degenerative joint disease, although the coxofemoral joint still showed evidence of mild subluxation, probably due to the rupture of the round ligament (Fig 4). A medial patellar desmotomy was performed on the left hindlimb under local anaesthesia with the pony standing. The pony was discharged with instructions for two weeks box rest before the sutures were removed, followed by four weeks walking 'in hand' from the box before it was turned out in a small paddock for a further six weeks.

Over the next two years the pony remained comfortable at pasture, and the owners reported no visible lameness during this period. However, it suddenly became severely lame two years and three months after the luxation had been reduced. A clinical examination showed the pony to be 5/10 lame at a walk, and 8/10 lame at a trot. The pony's stance had a turned-out stifle and foot and turned-in hock, but there was no appreciable shortening of the limb. Ventrocranial-dorsocaudal oblique radiographs of the pelvis showed a chronic subluxation of the coxofemoral joint, with extensive osteophyte formation around the acetabular rim. In view of the advanced osteoarthritis, the owners elected to have the pony euthanased.

Discussion

Although there have been several reports of coxofemoral luxation (Mackay-Smith 1964, Rothenbacher and Hokanson 1965, Davison 1967, Bennett and others 1977, Nyack and others 1982, Malark and others 1992), the condition is uncommon in horses (Adams and Fessler 1988) owing to the strong ligamentous support provided to the joint by the round ligament and the accessory femoral ligament, and by the fibrocartilaginous lip surrounding the acetabulum (McIlwraith 1987). When the condition does occur, it most frequently affects young horses and ponies (Stashak 1987). In adult horses, the ileum is more likely to fracture before the coxofemoral joint luxates (Stashak 1987). The most common cause of these luxations appears to be trauma, although they have been recorded in foals as secondary to the fixation of the tarsal region in a cast (Trotter and others 1986) and to upward fixation of the patella (Foerner 1992); in the latter case it occurs as a result of the violent contraction of the quadriceps muscles, which attempt to flex the limb when it is caught in extension, and dislocate the coxofemoral joint rather than flex the stifle (Foerner 1992). A violent overextension of the limb or falling on the point of the stifle with the femur in a vertical position will also produce the condition (Stashak 1987). A pony with upward fixation of the patella is likely to hold its leg in such a way that this may occur. A malformation of the coxofemoral joint has been reported to predispose to the condition, although there was no evidence of any such problem in this case (Jogi and Norberg 1962).

Coxofemoral luxation is not difficult to diagnose, because of the characteristic appearance of the affected limb, which appears shorter than the contralateral limb, with the toe and stifle turned out, and the hock turned in. The hock of the affected limb appears to be higher than that of the contralateral limb. Radiography was used to confirm the diagnosis in this case. In the authors' experience, standing pelvic radiography is an excellent technique and it is used routinely for all cases in which pelvic damage is suspected (May and others 1991). However, some authors have questioned the safety and results of the technique (Butler and others 1993). Standing pelvic radiography allowed the persistent subluxation, secondary to the rupture of the round ligament, to be identified 80 days after the reduction. As a result, the possibility of the develop-

ment of osteoarthritis in the coxofemoral joint was communicated to the owner, with a cautious prognosis. It is most unlikely that the subluxation would have been identified at this stage without the radiographic examination.

Upward fixation of the patella has traditionally been treated by desmotomy of the medial patellar ligament, although the authors rarely find it necessary to use this technique and find that most cases respond to increasing exercise in order to build up the muscle tone in the affected hindlimb.

Several techniques have been advocated for the treatment of coxofemoral luxation. Textbooks describe closed reduction (Stashak 1987, Adams and Fessler 1988), although few successful reports of this technique could be found (Nyack and others 1982, Malark and others 1992). Surgical treatments, including transacetabular pinning, ischio-ileal (DeVita) pinning and total hip replacement, have been reported but with little success (Malark and others 1992). A technique of trochanteric transposition has been advocated, although no examples were described (Stashak 1987). Toggle pinning has been used in calves (Adams 1957), but no reports of its use in horses could be found. An autograft taken from the ileal wing has been used to extend the dorsal acetabular rim to maintain a reduction (Malark and others 1992). Excision arthroplasty has been used, although some reports indicate that the survival rate after such treatment is no different from that of animals treated conservatively (Mackay-Smith 1964, Malark and others 1992); successful outcomes have been reported by Platt and others (1990) and Squire and others (1991).

In this case the successful reduction was maintained by the use of an Ehmer sling (Brinker and others 1983), which is commonly used to maintain a reduction in dogs and cats. The unsuccessful use of the sling after a reduction has been reported by Trotter and others (1986) and Malark and others (1992). This case is the first report of the successful application of such a sling in a horse or pony, although its use was probably only possible because of the small size and tractable nature of the animal. Even so the pony appeared initially to be distressed by the sling and there was concern about its effect on the blood circulation through the limb. Nevertheless, it appears that the sling can be beneficial and should be considered in selected cases.

The prognosis for the treatment of coxofemoral luxation is variable. Good results have been reported by Nyack and others (1982) and Foerner (1992), but other authors have offered a guarded to poor prognosis (Stashak 1987, Malark and others 1992). This pony was able to live comfortably at pasture for two years, before it became severely lame again as a result of osteoarthritis of the coxofemoral joint. The long-term outcome in this case was not surprising in view of the radiographic findings of the mild subluxation present after the reduction, although it is surprising that it took over two years for clinically apparent osteoarthritis to develop.

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Short Communications

Osteochondrosis in a pedigree Suffolk ram

M. L. Doherty, H. McAllister, S. Rackard, C. Skelly,
H. F. Bassett

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OSTEOCHONDROSIS (dyschondroplasia) is a focal disorder of endochondral ossification which is characterised by retention of epiphyseal or growth plate (physeal) cartilage (Thorp and others 1993). Osteochondrosis is recognised as a cause of lameness in dogs (Slater and others 1992), pigs (Dewey and others 1993), poultry (Thorp and others 1993), cattle (Jensen and others 1981) and horses (Pool 1993). This communication describes a clinical case of osteochondrosis in a pedigree Suffolk lamb. To the authors' knowledge, there have been no previously published clinical reports of osteochondrosis in sheep.

A 10-month-old pedigree Suffolk ram lamb which weighed 100 kg was admitted to the Faculty of Veterinary Medicine in November 1994 with a history of lameness involving the right forelimb. The ram was from a pedigree Suffolk flock of 30 ewes and had been purchased at eight months of age weighing 80 kg. Details of the animal's diet before purchase are unknown; following purchase, the ram was at pasture and fed ad libitum concentrate containing 16 per cent crude protein. The lameness was first noticed approximately 10 days after a period of mating activity. It was intermittent and had been present for six weeks before admission despite periodic treatments with non-steroidal anti-inflammatory drugs. There were no other sheep affected.

The ram was in good general health and lameness was not apparent when the animal was viewed at rest or at exercise. All the claws were healthy and no obvious heat or swelling was associated with any of the joints. Slight crepitus was detected during flexion and extension of the right elbow joint; deep palpation of the joint capsule elicited a pain-withdrawal response and the ram exhibited moderate supporting limb lameness following manipulation of the joint. Both prescapular lymph nodes were of normal size. Routine haematological examination revealed no abnormali-

ties, and the plasma levels of fibrinogen (5 g/litre), calcium (2.7 mmol/litre), magnesium (0.9 mmol/litre), inorganic phosphate (2.2 mmol/litre) and copper (12.5 µmol/litre) were within the normal range.

The ram was sedated using intramuscular xylazine (Chanzine 2 per cent; Chanelle Pharmaceuticals) at a dose rate of 0.1 mg/kg bodyweight and placed in left lateral recumbency. Lateromedial and caudocranial radiographs were taken of the right elbow. On the caudocranial study there was a focal 0.5 cm circular radiolucent defect within the subchondral bone on the distomedial aspect of the medial humeral condyle. The defect involved the articular margin; there was an associated widening of the joint space at this site and a distinct sclerotic rim was identifiable (Fig 1a). A small osseous cyst-like defect was also present in the opposite side of the articulation within the proximal radius. Radiological examination of the left elbow joint revealed no abnormalities (Fig 1b).

A tentative diagnosis of osteochondrosis was made and a surgical approach to treatment was decided upon. Following induction of anaesthesia with intravenous sodium thiopentone solution (Intraval Sodium; RMB Animal Health) at a dose rate of 15 mg/kg bodyweight, the ram was intubated and general anaesthesia was maintained using a concentration of 2 per cent halothane (Fluothane; Coopers Pitman-Moore) in oxygen. A curved incision was made over the medial aspect of the elbow joint, the flexor carpi radialis muscle was sectioned and distal retraction of the flexor carpi radialis exposed the medial collateral ligament. The medial collateral ligament and the joint capsule were incised and the lesion was identified on the medial condyle. The lesion consisted of an elevated flap of articular cartilage approximately 0.5 cm x 0.5 cm. It was removed by sharp incision at its base of attachment. The area underlying the flap was curetted to subchondral bone and the joint was irrigated with sterile saline before closure. A kissing defect on the radial head was also noted during surgery but was not treated. A Robert Jones bandage was applied following surgery to give support to the limb and limit postoperative oedema. Weight bearing on the affected limb was limited for the first 10 days after surgery. However, significant improvement was noticed after that time and approximately eight months later no lameness was evident and no pain was associated with manipulation of the elbow joint.

A small volume of joint fluid aspirated prior to arthrotomy appeared slightly turbid and blood-tinged. Cytological examination revealed that the leucocyte population consisted predominantly of macrophages. No bacteria were cultured aerobically or anaerobically from the joint fluid. The biopsy submitted for histopathology consisted of cartilage with areas of viable tissue and areas of necrosis where chondrocytes in various stages of dis-

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