Osteopathic manipulative treatment for knock knee: a case report

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BACKGROUND (1)

Musculoskeletal disorders in dogs and cats:

- Skeletal growth disease is very common in all breeds, especially if they are large and giant.
- Etiology related to genes, age and physical stress.
- Muscles, joints, tendons, ligaments and nerves of the body are involved
- Severity assessment: from mild (few pain, impairment in motion) to severe (disruption of proper locomotion and movement).

BACKGROUND (2)

Genu valgum:

- is a deformity affecting giant breed dogs, resulting in "knock knees.”
- the same deformity has been recognized as a growth problem in humans experiencing disproportionate lengthening and rapid periods of growth.

BACKGROUND (3)

Genu Valgum (Early 70s) :

- Stone 1969.[1]: described the disease
- Riser [2]: described the histologic changes of the distal femur and provided etiopathogenetic hypotheses
- Rudy 1971.[3]: described the treatment

[1] Stone JA, Rogers MD, Riser WH: Clinico-pathologic conference. J Am Vet Med Assoc 155:1376, 1969
[2] Riser WH, Parkes LJ, Rhodes WH et al: Genu valgum: A stifle defomlity of giant dogs. J Am Vet Radiol Soc 10:28, 1969
[3] Rudy RL: Corrective osteotomy for angular deformities. Vet Clin North Am 1:549, 1971

BACKGROUND (4)

Etiology:

- not well understood, probably a selective arrest of normal skeletal development.
- seems to be associated with the rapid growth phase that occurs in giant breed dogs between 4 and 6 months of age.

BACKGROUND (5)

- **Pathogenetic mechanisms:**

1. The rapid growth period of the distal femoral epiphyseal plate and the proximal tibial epiphyseal plate exceeds the metabolic or nutritional supply that local vasculature can provide.

2. Retained endochondral cores indicative of nonmineralization in endochondral bone formation are seen within the lateral femoral condyle

3. Selectively, growth within the distal lateral femoral condyle and the proximal lateral tibial condyle slows.

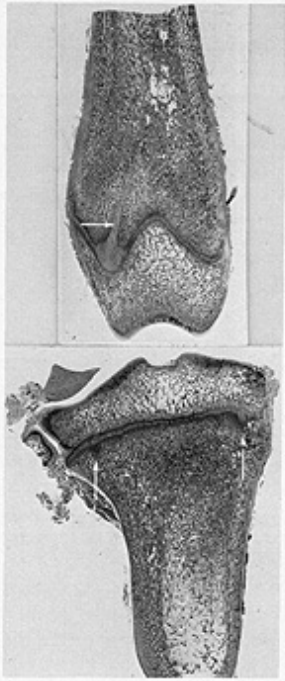


FIG. 56-1 Histologic sections of the distal end of the femur and the proximal end of the tibia of a 3½-month-old Irish wolfhound. The lateral sides (*left*) of the metaphyseal areas of the distal femur and proximal tibias are not developing at the same rate as the medial sides. A core of hypertrophic cartilage remains, extending proximally into the metaphysis from the growth plate of the femur and downward from the growth plate of the tibia (*arrows*). The lateral side of the tibia angles downward. The growth plate cartilage has been lengthened on both the medial and lateral sides of the tibia. (Riser, WH, Parkes LJ, Rhodes WH et al: Genu valgum: A stifle deformity of giant dogs. J Am Vet Radiol Soc 10:28, 1969)

BACKGROUND (6)

4. Normal rate of bone formation and growth continues within the medial femoral and tibial condyles.
5. With time the bowing at the knee becomes marked, resulting in a medial bowing of both the femur and tibia (genu valgum).
6. lateral patellar subluxation or luxation (Fig. 56-5, A)

BACKGROUND (7)

7. compensatory coxa valga and anteversion, resulting in hip subluxation that may resemble canine hip dysplasia. (Fig. 56-5, A)
8. the tarsus progressively rotates laterally ("cow-hocked" posture).
9. complete patellar luxation.
10. progression of the deformities towards the degenerative joint disease (Fig. 56-3).
11. generalized atrophy of muscles of the rear quarters (arched-back posture (Fig. 56-4)

BACKGROUND (8)

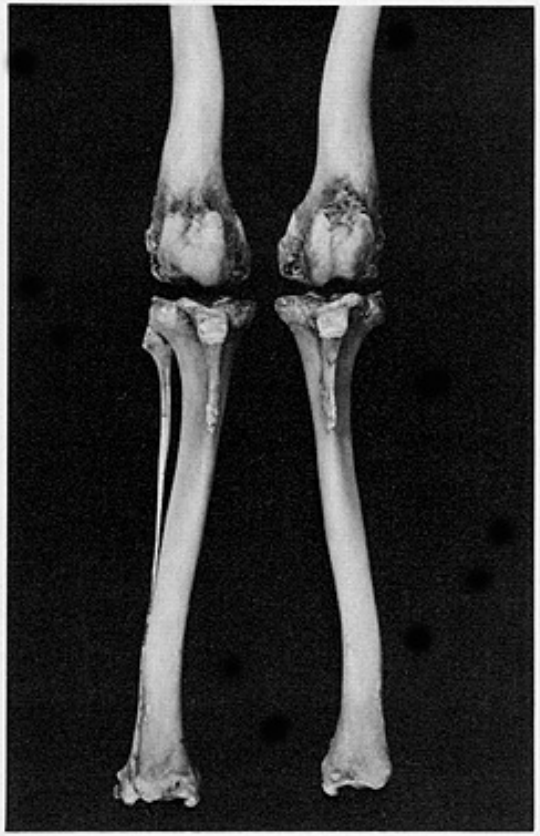
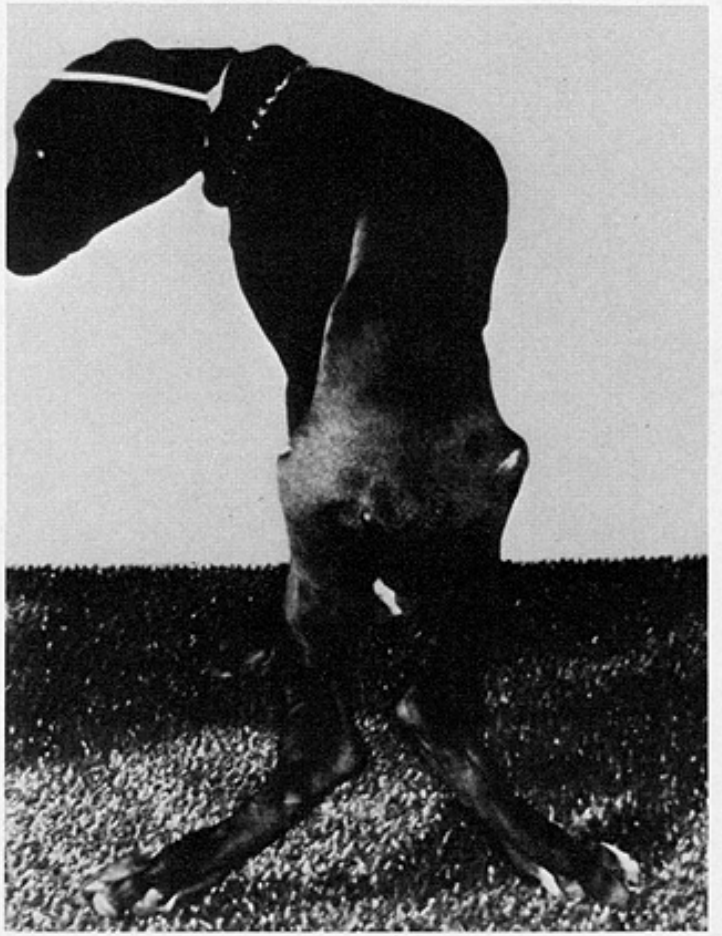


FIG. 56-3 An 11-month-old Great Dane with macerated femurs, tibias, and right fibula. There is genu valgum and degenerative joint disease of the distal femurs and proximal tibias. (Riser WH, Parkes LJ, Rhodes WH et al: Genu valgum: A stifle deformity of giant dogs. J Am Vet Radiol Soc 10:28, 1969)



-4 Photograph of a 7-month-old Great Dane exhibiting :eristic hind limb deformities seen in genu valgum.

BACKGROUND (9)

Gene Valgum Diagnosis:

- Great Dane, Irish Wolfhound, and St. Bernard
- first signs of the disease as early as 5 months of age
- if not recognized early, the dog will present with evident deformities
- male female ratio 1:1

BACKGROUND (10)

Therapy:

- drugs and rest
- restricted diet
- surgical therapy (an early corrective procedure may prove ineffective or inadequate as the dog continues to grow).

AIM OF THE STUDY

- To show the benefits of OMT in improving muscle-skeletal parameters in a Great Dane puppy affected by knock knee.

METHODS (1)

- male puppy, purebred harlequin Great Dane, 4 months old
- presented first at the veterinary physician with a diagnosis of genu valgum deformity of the right knee
- associated morbidities were: coxo-femurs dysplasia, ligamentous laxity of both coxo-femoral joints and shortening of femurs neck

METHODS (2)

Therapy:

- drugs for joints protection
- restricted diet to reduce dog's weight
- osteopathic treatment

The physician also considers euthanasia as an hypothesis because of the possibility of severe further disability of the animal

METHODS (3)

OMT (Osteopathic Manipulative Treatment)

- After the first osteopathic structural evaluation, 5 weekly OMT sessions scheduled
- OMT Follow up
- Each treatment included a structural and functional evaluation and manipulative procedures to restore motion
- The manipulative techniques used included myofascial release, functional techniques and Sutherland's techniques
- The treatment was secondary to the structural examination and did not follow a predetermined protocol.

METHODS (4)

- RX T0

METHODS (5)

METHODS (6)

- Video T(0)

METHODS (7)

- After 1 week:

METHODS (8)

- Video Follow up

RESULTS

Results:

- After the 5 OMT the dog underwent the second veterinary visit
- a significant reduction of the deformities was documented
- Functionally the dog walking was diagnosed fully recovered

CONCLUSION

Conclusion:

- OMT played a crucial role in the treatment of a purebred harlequin Great Dane with knock knee
- further studies, with stronger design and appropriate sample, are needed to demonstrate the effectiveness of osteopathic treatment

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