

SKELETAL AND ANGULAR LIMB DEFORMITIES

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Definitions (Platt 1979)

Malformations

A disturbance of foetal growth such that organs or parts fail to develop, or do so in an abnormal situation or manner. e.g. polydactyly, anencephaly, microphthalmia.

Deformity

A condition in which the limbs or other parts are anatomically complete but are abnormally flexed, extended or deviated possibly as a result of pressures or restrictions in the uterus. e.g. carpal valgus.

Skeletal Malformations

1. **Prognathism.** Can apply to the mandible or the maxilla. The incisor surfaces do not meet. Some parrot jaw cases can show marked improvement during growth.
2. **Cleft Palate** can involve variable lengths of the hard palate or the soft palate only. Surgical repair has been attempted via mandibular symphysotomy.
3. **Tooth Root Cysts** in the mandible or maxilla can be insoluble problems. The dentigerous cyst usually becomes apparent later in foalhood or as a yearling. Surgery is usually successful.
4. **Microphthalmia** can vary in degree and be uni- or bilateral. Enucleation is a cosmetic option which can be undertaken when the foal is older. The bony orbit is usually normal.
5. **Polydactyly** is rare. Most originate at distal metacarpal level and surgical removal is best left until the foal is well out of the neonatal period.
6. **Adactyly** and **Hypoplasia of phalanges** are even rarer.
7. **Atlanto-occipital fusion** reported in Arabs and Thoroughbreds. Fusion of 1st and 2nd cervical vertebrae is clinically apparent as the characteristic wing of the 1st or atlas vertebra is not visible or palpable. Not necessarily ataxic but neck mobility is restricted.
8. **Wobbler Disease.** K. Whitwell has found Type

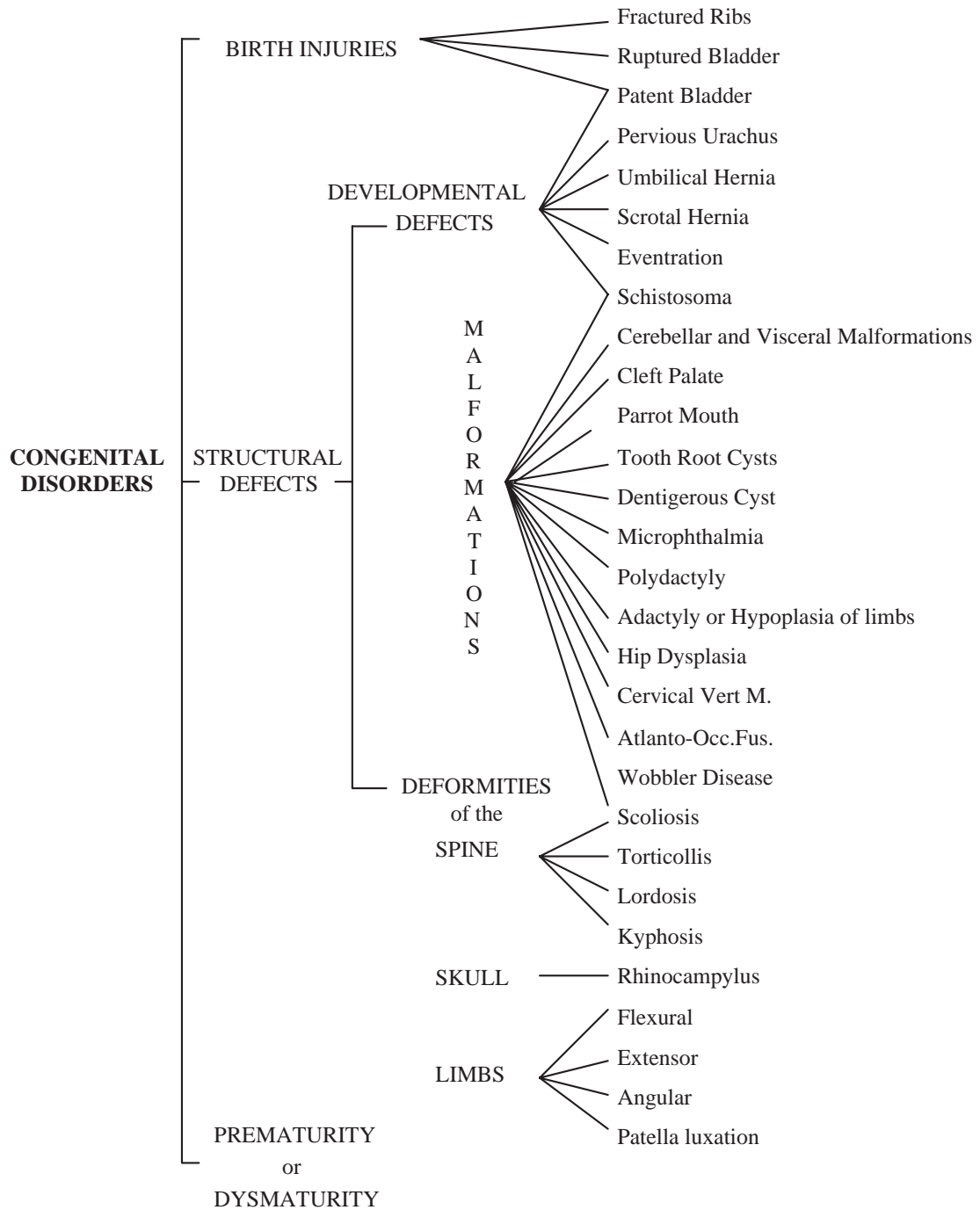
2 cervico-vertebral malformation lesions in a foetus but it must not be assumed that it is a malformation which is commonly responsible for Wobbler Syndrome in young horses.

9. **Scoliosis** can occur as a malformation, with fusion of or incomplete posterior thoracic vertebrae, or as a deformity. Milder cases of the latter can improve with growth and allow the animal to be an athlete. Kyphosis is often also present. It is sometimes seen with other malformations or deformities, particularly flexural deformity of both carpi. These are what Rooney (1966) called "contracted foals" and most cases warrant destruction.

Skeletal Deformities

1. **Torticollis** causes dystocia unless the foal is markedly undersized. There can be degrees of arthrogyriposis.
2. **Lordosis** is not usually apparent until the older foal or yearling stage. Growth spurts, in which the quarters stand higher than the wither, can deceive one into thinking a foal or yearling is affected.
3. **Kyphosis** is rare on its own and is more likely to be seen with scoliosis or as a secondary condition in a foal which is lame on fore or hind limbs.
4. **Rhinocampylus** can involve the skull as a whole or the premaxilla, with or without the mandible being affected. Mild cases improve with age and are not clinically, and hardly even cosmetically, significant. More severe cases can result in obstruction of the nasal cavity on the convex side. Although heroic surgeries have been reported, such cases should be destroyed.
5. **Limb Deformities.**
 - a) **Flexural**, incorrectly called contracted tendons.
 - b) **Extensor deformities** or hyperextensions almost always resolve spontaneously, arthrogyriposis is very rare with these.
 - c) **Angular** can be valgus, varus or rotational and occur in conjunction with a) or b).

**CLASSIFICATION OF CONGENITAL DISORDERS
(AFTER PLATT 1979)**



These are the commonest deformities encountered in foals and most, some even quite severe ones, resolve spontaneously. Don't get too aggressive too soon. Patient, conservative care is often very rewarding.

d) **Patella luxation** is very rare.

The essential nature of limb deformities is mostly of joint or ligament laxity or musculo-tendinous imbalance between agonist and antagonist. Angulation of bone is uncommon and mainly seen in metatarsi. If severe, the articular and peri-articular structures such as sesamoids and suspensory ligament branches and flexor tendons can be deformed or malpositioned. Heroic surgery has been reported (wedge osteotomies etc.). Intra-uterine fracture is rare but has been seen in the metacarpus.

Aetiology is unknown but malpositioning or lack of space in utero is popularly blamed. However, large foals or twin foals do not have a greater incidence. Some authors have reported flexural deformity incidence increasing with high protein diet given to the mare in late pregnancy. Hypothyroidism and overfeeding the mare with Iodine have also been blamed. Heredity is an unknown factor but certain mares seem to produce more than their share of foals with carpal valgus and I suspect some stallions of the same.

Flexure Deformities

1. Coronopedal/distal interphalangeal joint

Mainly in the foreleg and often bilateral. If able to bear weight on the toe, controlled exercise on a firm surface is successful. If knuckling over, carefully apply a gutter splint to the front of the leg. Ensure that the limb distal to the carpus is bandaged with thick layers of cotton wool or Gamgee to prevent pressure sores. Often seen in association with:

2. Fetlock

Front or hind limb(s). Treat as above. General anaesthesia may help application of a good splint to a bad case. They always come right unless there is bone deformity or arthrogryposis.

3. Carpus

Mostly bilateral. They will gradually correct with controlled exercise if they can stand for any length of time. The case which worsens at a few days old may have ruptured the common digital extensor tendon on the front

of the knee and require casting. Casts may be helpful to uncomplicated cases and in a few we just support the fetlock with a splint and this can help the foal stand quite well. Surgical section of the ulnaris lateralis and flexor carpi ulnaris tendons just above the pisiform may be tried if no improvement is seen by 4 weeks old. Results have been disappointing.

Severely flexed carpi can cause dystocia. If there is very limited extension due to arthrogryposis, surgical correction will not succeed and the foal should be destroyed. Always look for other congenital defects before treating these cases. It is worth treating foals with congenital flexures of limbs with a high dose of intravenous Oxytetracycline using 1G/16kg bwt which can be repeated after 48 hours. Initial responses can be encouraging but beware that they are not temporary. Careful conservative management as outlined above may still be necessary.

4. Tarsus

Rare - fixed in 90 degree flexion. Have never treated, only destroyed. Note the foals with weak curby hocks (and a few with apparently normal conformation) which can suffer crushed tarsal bones leading to a characteristic spavined appearance and bunny hopping gait when cantering. Their prognosis is not good.

Extensor Deformities

1. Coronopedal or distal interphalangeal joint

Mainly seen in hind legs and can take months to come right. Protect the heels against abrasion. Surgery or casts are not recommended. The application of a firm heel extension by an experienced farrier using Equithane can be helpful in shortening the correct time. Can occur in all limbs in conjunction with:

2. Fetlock

Usually comes up quickly (within 2 weeks) with exercise. Can occur with:

3. Carpus and Tarsus

Also improve rapidly with exercise even if a hock is overextended beyond straight. Treatment is unnecessary.

These extensor deformities can be a feature of prematurity or dysmaturity but are not diagnostic of those states.

Arthrogryposis of extensor deformities is very rare.

Angular Deformities

1. Carpus

Valgus (knock-kneed) commonest. Often bilateral or can be seen with contralateral varus deformity. Can be present at birth or appear/worsen at 2-3 weeks old when pathology in the carpal bones and/or epiphysis is initiated. Rest is best. Trim feet and the application of medial hoof extensions to the valgal limb can be very helpful. Casts or splints are of very dubious value. The capacity of most cases to straighten spontaneously questions the validity of early surgery, splints, shockwave treatment and even fitting of extensions. Beware over-correction. Surgery by 3 months old or earlier if necessary. Choice of technique must match the severity of the angulation and pathology within the carpus.

2. Fetlock

Often angled with and corrects with the carpus. Splints can be helpful soon after birth, particularly if in association with a flexural deformity. Limit exercise of a bad case and trim the feet. Again the appropriate hoof extension can be very helpful. Varal angulation of a hind fetlock is usually the most troublesome and may also have a curvature of the cannon. If surgery is necessary do it early - best by 4 weeks but a single trans-physeal screw bridging can be very successful, even in older foals.

3. Tarsus

Bilateral valgus, or valgus of one and varus of the other, which gives the foal a tilt of the pelvis as it walks. Often seen in conjunction with a significant angulation of the fetlock, which usually gives more cause for concern than the hock. Bilateral varus is very rare. Most correct spontaneously with exercise, hoof trimming and if necessary the appropriate hoof extension. Surgery is impractical for varus (angulation usually at tarso-metatarsal level) and rarely necessary for valgus. If so insert a cortical bone screw proximally across the growth plate at the medial malleolus.

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