



Hip Dysplasia in Dogs

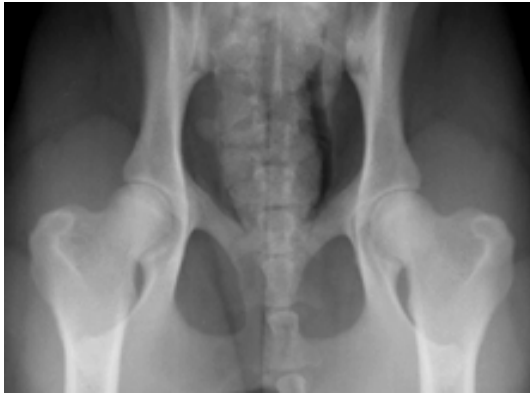
Triple Pelvic Osteotomy (TPO)

John Ferguson BVM&S CertSAO MRCVS

Alasdair Renwick BVMS CertSAS MRCVS

What is Hip Dysplasia (HD)?

Hip dysplasia is the abnormal development of the hip joint and is the most common cause of hip osteoarthritis in dogs. All dogs are born with normal hips but early in their development hip



X-ray of a dog with normal hips (note both femoral heads positioned well within the sockets)

joint laxity (looseness) occurs and allows the femoral head (ball) to knock in and out the acetabulum (socket) as the dog moves and runs. This causes damage to the soft cartilage and also the rim of the acetabulum resulting in early "wear and tear", inflammation and ultimately osteoarthritis where the protective cartilage layer in the joint is rubbed away exposing bone. This can occur even in puppies a few months old.



Juvenile hip dysplasia. Note both femoral heads subluxated (displaced) from the sockets.

In addition to the laxity, the socket is often not positioned properly being too "open" allowing the

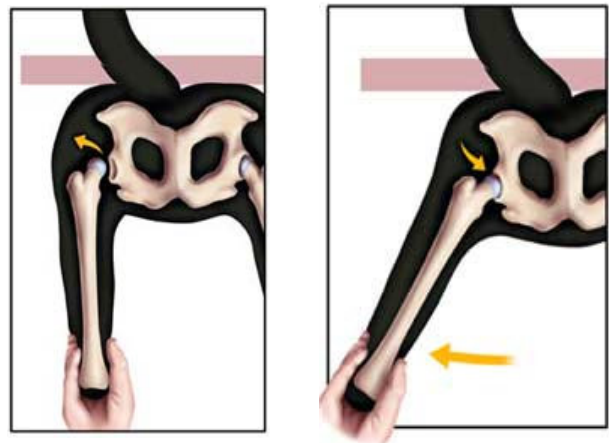
femoral head to easily subluxate (move in and out of the socket).

Signs of hip dysplasia

Signs of hip dysplasia can vary enormously from patient to patient. Mildly affected dogs will exhibit stiffness, particularly on rising. Exercise intolerance is often a feature with some dogs being reluctant to stand for long periods of time. This can often be construed as the pup being "lazy" or "tired". Lameness is sometimes evident but because the condition is often bilateral (affecting both joints) this often manifests as a "bunny hopping" gait where both hindlimbs move together simultaneously. Occasionally, owners may hear (or feel) a "clunking" noise emanating from the hindquarters when the femoral heads slip in and out of the sockets. Difficulty jumping or negotiating stairs can also sometimes be evident.

Diagnosis of Hip Dysplasia

Diagnosis of HD is based on the history and clinical signs (see above). Manipulation of the hips will reveal the hip joint laxity (looseness) with the femoral head being able to be moved easily out and in the socket (see diagrams below). X-rays will show hip joint laxity (see above) and possibly early osteoarthritis. Special views of the pelvis will highlight the rims of the sockets to determine the presence and extent of the eburnation (wear of cartilage and bone).



Treatment options for Hip Dysplasia

There are several options for treatment of young dogs (usually under 10 months old) with hip dysplasia.

- Conservative management
- Corrective surgery by Triple Pelvic Osteotomy (TPO)
- Total Hip Replacement (THR). See separate information sheet
- Excision arthroplasty (removal of the diseased femoral head and neck). See separate information sheet

Conservative management

Some patients mildly affected by hip dysplasia will not require surgery and the lameness will often settle with conservative (non-surgical) management (see box below). In around 50% of affected cases, limb function will improve over time with stiffness and lameness problems becoming intermittent and infrequent as the dog matures (12-15 months old). Many of these dogs will do well in the short to medium term and lead fairly normal active lives. Osteoarthritis will, however, progress and could cause issues at some stage in the future.

Conservative management of hip dysplasia and early osteoarthritis ("WET" regime)

- **Weight**
It is imperative that the patient is within the correct weight range for their breed and type. Adjustment of food intake may be required.
- **Exercise**
Modification of activity may be necessary, avoiding crazy periods of vigorous exercise such as ball/frisbie chasing. High impact twist/turn activities should be discouraged. Generally, no more than 20-30 minutes of leash exercise should be allowed daily with shorter periods off leash. Exercise may be increased once the patient is mature.
- **Treatment**
Anti-inflammatory/pain killing drugs may be prescribed and used continuously, at a low dose or intermittently at higher doses. Dietary supplements such glucosamine can be considered but there is currently little evidence to verify their efficacy

Triple pelvic osteotomy corrective surgery (TPO)

TPO aims to restore the normal position of the femoral head (ball) within the acetabulum (socket) without the

constant movement/knocking which causes damage as outlined above. Since there is no technique that can "tighten" the hip (this will occur naturally as the dog matures) the only option is to tilt the cup over the head to allow "capture" (see Figure 1.)

The procedure involves cutting the pelvis (osteotomy) at three locations to allow the cup segment to be rotated to cover the femoral head by a calculated amount (usually 20-30 degrees). A specially designed plate is then applied to the side of the pelvis secured with screws to stabilise the cut bone. The pelvis is allowed to heal in this new position. Cartilage damage is therefore prevented and development of osteoarthritis dramatically slowed.



Figure 1. Rotation of socket to "capture" head

Occasionally, only one hip may be a candidate for TPO with the HD in the other hip being managed successfully by conservative means. If both hips require TPO, then the procedures can be staged 2-3 weeks apart. Salvage surgery (total hip replacement or excision arthroplasty) may be necessary on the hip that is not a candidate for TPO due to progression of osteoarthritis

TPO is a major surgical technique and not without potential complication, namely post-operative infection, problems with loosening of the plate and screws and possible intra-operative damage to the sciatic nerve. However, these issues are thankfully rare and careful candidate selection usually allows an excellent outcome in the majority of patients with a return to full, normal and pain-free exercise.

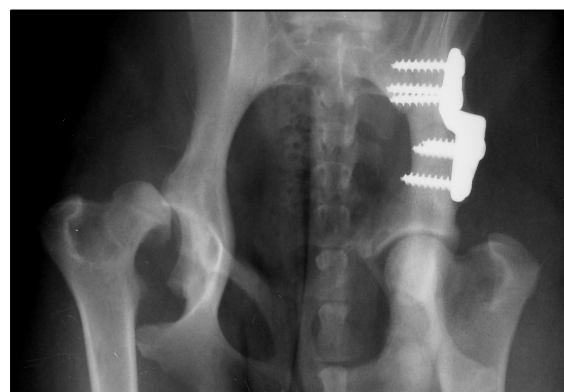


Fig 2. Post-operative X-ray taken 3 months after TPO showing a normal right hip. However, osteoarthritis has developed rapidly in left, non operated hip.