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“Henry” - Tibial Plateau Leveling Osteotomies (TPLO) and DARthroplasty in a Dog with Addison’s Disease



“Henry”

“Henry” is a neutered male Springer Spaniel. He had a history of intermittent rear leg lameness. Henry was presented to the referring veterinarian with a history of trembling, lethargy, loose stools, and occasional vomiting. Blood test results suggested that Henry had a condition called Addison’s disease. Also known as hypoadrenocorticism, this condition results in insufficient mineralocorticoids produced by the adrenal glands. The adrenal glands produce two types of steroids: Mineralocorticoids, which regulate electrolyte (“blood salts”) metabolism, and glucocorticoids (“cortisones”), which regulate sugar metabolism, as well as have numerous other effects. The glucocorticoids also have an effect on electrolyte metabolism.

The blood tests showed that sodium and chloride were low and potassium was high. If the condition is left untreated, potassium levels could potentially get so high as to slow or even stop the heart. Kidney function tests were also elevated. The diagnosis was confirmed by doing a special test, called an ACTH Stimulation Test. In this test, ACTH (drenocorticotrop hormone), which is produced by the pituitary gland in the brain to stimulate production of both mineralocorticoids and glucocorticoids from the adrenal glands, is given to the patient. The level of cortisol, a glucocorticoid, is measured both before and after the ACTH is administered. If the resting cortisols are low and remain low after ACTH is given, this is highly suggestive of hypoadrenocorticism. In Henry’s case, both were low.

During the testing for hypoadrenocorticism, examination re-

vealed that Henry had bilateral ruptured cranial cruciate ligaments. The left cranial cruciate ligament was partially torn, but the right one was completely ruptured. He was referred to SCVH for an orthopedic evaluation the next day. We found that he also had hip dysplasia of the left hip joint. First, however, we needed to get the hypoadrenocorticism under control before any surgery could be contemplated.

Henry was started on Florinef mineralocorticoid tablets with intermittent use of Prednisone, a glucocorticoid. CosequinR, a chondroprotective medication, primarily composed of chondroitin sulfate and glucosamine HCL, was also given with the aim at minimizing joint degeneration during the “regulation” period prior to surgery. Henry was also hypothyroid ... that is, his thyroid levels were low. To regulate this condition, we put him on Soloxine, a thyroid supplement.

A recheck of Henry's blood tests two weeks later revealed his electrolytes (sodium, chloride, and potassium) had improved and were almost normal. Henry was more lively and his appetite was improved.



Figure 1. Preoperative left stifle



"Henry" cont.



Over the next two weeks blood tests were rechecked periodically. They were variable, stayed near, but not quite, normal. It was decided that Henry was stable enough to proceed with the first knee surgery.

A month after treatment for Addison's disease was begun, a Tibial Plateau Leveling Osteotomy (TPLO) was performed on Henry's right stifle (knee) joint. His tibial plateau slope was a severe 33° (Figure 1). It was leveled to 8.5° (Figures 2, & 3).

Henry was continually treated with Florinef, Prednisone, and antibiotics. Rechecks of his electrolytes revealed that they remained near normal. Reexamination a month later showed that the TPLO surgery and the fracture repair were healing well, the incision had healed nicely, and Henry was using the leg surprisingly well. His electrolytes remained about the same as in previous blood tests. Five days later, Henry stopped bearing weight on his left rear leg.

Three weeks later, a second TPLO was performed on Henry, this time on his left stifle joint. His 31° tibial slope (Figure 6) was leveled to 5.5° AND 6° of internal tibial torsion (rotation) was corrected so that the leg was corrected to be perfectly straight! (Figures 7 & 8). Some correction of internal rotation was also performed on the right stifle joint at that time. His electrolytes, tested four days later, were NORMAL!



Figures 2. Immediately post-operative condition of right knee .



Figures 3. Immediately post-operative condition of right knee



Figure 6. Preoperative condition of left knee

Henry was pretty active on his operated leg. So active, as it turned out, that at recheck on March 24, 2000 radiographs revealed a fracture of the tibial crest (Figure 4). The fracture was repaired with two small pins and a wire on March 27 (Figure 5).



Figure 4. Fracture of tibial crest



Figure 5. Repair of tibial crest fracture



Figures 7 & 8. Immediately postoperative condition of left knee .



Figure 8.



Nine weeks later, Henry came in for another recheck.. He was jumping up on the owners for the first time in his LIFE! He runs and plays better than he ever has. He has a big appetite, which is unusual for him. Radiographs of his stifle joints showed that his TPLO's were healing well, all the metal implants were quiet and just as they were implanted, and both joints did not show any signs of progressive degenerative joint disease (arthritis) (Figures 9-14).



Figures 9 & 10: Anterior-Posterior view of the right knee after four months



Figure 11. Lateral view of the right knee after four months



Figure 12. Anterior view of the left knee after four months



Figure 13. Posterior view of the left knee after four months



Figure 14. Lateral view of the right knee after four months



"Henry" cont.



Henry still has left hip dysplasia (Figure 15) and there are plans in the next few months to address that problem (before it gets significantly worse). Clinically, he is doing extremely well, but blood tests showed that his electrolytes were again out of the normal ranges, so adjustments (increases) in his Florinef and Prednisone dosages were made.

Six weeks later, we changed Henry's mineralocorticoid management from Florinef tablets (given 2-3 times daily) to injections of Percorten, a long-lasting injectable agent that lasts a month. His subsequent blood tests have shown normal (or very near-normal) electrolyte levels since.

Two months later, we performed a minor DARTHroplasty on Henry's left hip. The surgery went very well. Figures 16 & 17 show Henry two weeks after his left DARTHroplasty. He is using both legs almost completely normally, going through the doggie door, trying to jump up on furniture, and going up stairs! His long-term prognosis looks terrific! His owners say he is playing & doing things he's never done before, even when he was a puppy!

Henry is a sweetheart & has been a WONDERFUL patient through all his travails. Certainly he has been worth all the trouble. His family loves him dearly.

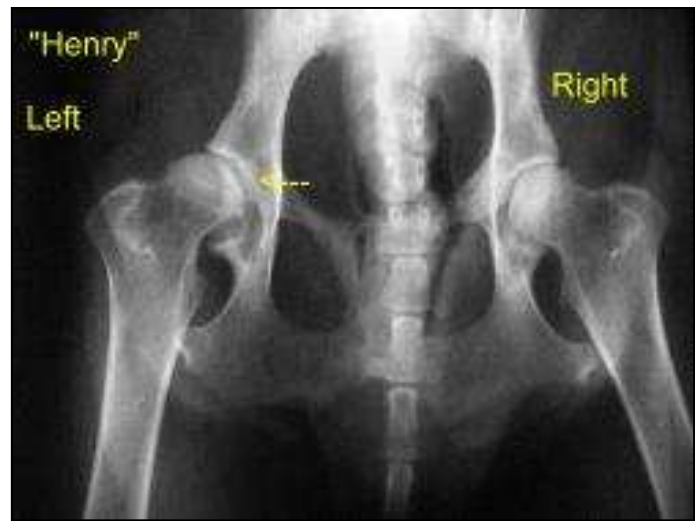


Figure 15.
Left and right hip joints, showing dysplasia developing in the left hip.



Figure 16.
Anterior-Posterior view of the left knee after four months



Figure 17.
Anterior-Posterior view of the left knee after four months