

◆ ACSMA Newsletter ◆

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A SURGEON'S EXPERIENCE IN OVER 600 TIBIAL PLATEAU LEVELING OSTEOTOMIES (TPLO) PERFORMED IN A PRIVATE REFERRAL PRACTICE

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Rupture of the cranial cruciate ligament (CCL) is the most common cause of lameness in the rear legs of dogs. It affects both athletic and non-athletic dogs. Unless dealt with quickly and in an aggressive manner, CCL ruptures result in degenerative joint disease that may limit a canine's athletic career. In performing surgery over the past 34 years, I have seen a dramatic increase in the number and type of CCL injuries being presented. Fifteen to twenty years ago, most dogs presenting with CCL rupture were obese, middle-aged animals that incurred a complete rupture of the CCL while being active. Now what I see presenting are younger dogs (down to 9 months of age) exhibiting lameness, either unilateral or bilateral from partial CCL rupture. This often occurs with no history of an athletic event. We now perform over 300 CCL surgeries per year.

There are multiple ways to stabilize the stifle following CCL rupture. Prior to 1993, most surgeons either used an intracapsular or extracapsular technique. Multiple papers have shown that long-term, there is no difference in the outcome. What we know is that all dogs with these techniques develop advancing degenerative joint disease. Due to this fact, most surgeons were still searching for a way to allow athletic dogs to return to working. In 1993, Slocum described the tibial plateau leveling osteotomy (TPLO) procedure. Although there have been modifications in the procedure, it is basically still performed as Slocum described. Controversial in its infancy, the TPLO procedure is now being performed daily across the country by hundreds of surgeons.

Our practice has performed over 600 TPLO's since training in the procedure 2 1/2 years ago. The following is a review of information presented at the Veterinary Orthopedic Society meeting in 2003.

The TPLO procedure is

technically demanding and requires a great attention to detail. As a rule, I have been pleased with dogs' ability to return to pre-CCL rupture activity following a TPLO. There is a learning curve to the TPLO procedure. I feel it takes most surgeons 50 cases to get completely comfortable with the procedure. During the first 50 cases, a medial arthrotomy incision was performed. Either a medial meniscal release or partial meniscectomy was performed. At this time, the majority of cases receive only a "mini-approach"

to the caudal joint space. A meniscal release is performed through this limited approach. By avoiding a large arthrotomy incision, the dogs seem to rehab faster. No bandages are applied postoperatively. Ice packs are applied immediately postoperatively and the following day upon discharge from the hospital. The owners are instructed to apply cold compresses twice daily for 3-5 days. This helps reduce swelling and bruising that occurs from the medial surgical approach.

The left stifle comprised 57% of the cases with the right stifle being 43%. The tibial plateau slope preoperatively ranged from 19° - 36°, with a mean of 26°.

Postoperative slopes ranged from 3° - 10°, with a mean of 6°. Slocum says the ideal post-op slope is 5°. Bilateral TPLO's were performed on 17% of the cases. Mean time between the TPLO's was 6-8 months.

The five most common breeds (71%) were:

- Labrador Retriever (28%)
- Golden Retriever (18%)
- Rottweiler (11%)
- Newfoundland (8%)
- Mastiff (6%)

The mean age was 6.2 years with 51%

Continued on page 4

A.C.S.M.A.



AMERICAN CANINE SPORTS MEDICINE ASSOCIATION

American Canine Sports Medicine Association

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Canine Star

Canine athletes excelling in their performance sports

If you know of an athletic dog excelling in their sport, please send information to Dr. Patti Schaefer: PattiDVM@aol.com

"Termite" is a 4-year-old, all-American breed, named for his penchant for paper and wood products. He was a stray found in Mandeville, LA, wandering the road in September, 2001. He was taken home by Dr. Kathy Topham (DVM), who started training him in agility in September, 2002.

Their first show was March, 2003. In their first year of showing, they have achieved 15 titles in CPE (CL1-R, CL1-H, CL1-S, CL1-F, CL2-R, CL2-H, CL2-S, CL2-F, CL3-R, CL3-H, CL3-S, CL3-F, CL4-H, CL4-S,

CL4-F) and one title in NADAC (NAC). He makes his debut in Championship Division of USDAA on April 17th, jumping in the 22" height.

Termite's cross training routine includes hiking and biking to get his handler in shape, rollerblading and skijoring for strength training, wind sprints up and down hills with his fellow canine companions, and the occasional 5K to keep in shape. He does not enjoy swimming—perhaps a result of growing up in alligator country.

Although he has taken no formal obedience classes, Termite has also achieved the AKC's Canine Good

Citizen title, and he is a licensed therapy dog with Therapy Dog International. His specialty is senior-citizen assisted living homes. The Animal Rehabilitation Institute is proud to present Termite to the ACSMA!

If you have any further questions, please contact me:
Janet B. van Dyke, DVM
The Animal Rehabilitation Institute
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www.AnimalRehabInstitute.com



President's Letter

I hope everyone is enjoying a productive summer. I just returned from the International Retriever Team Competition in Ireland where the U. S. Gundog team (4 Labrador Retrievers) competed against teams from Wales, Scotland, England, Ireland and Northern Ireland. The U. S. Team won the team competition but placed 3rd in the individual event. Field trials in Europe are a bit different than in the U. S. with shorter retrieves required but lots of fence jumping and excellent obedience the key to success. British Labs are a bit more stocky and smaller than their American-bred cousins and the breeders on the continent more concerned with manners than speed and marking ability.

I also saw a formal Beagle pack ("foot Beagles") with their hunt staff in full dress regalia. Beaglers wear green coats instead of the more familiar red ones of foxhunting fame. The hounds were trained to move as a group...about 30 hounds...without running off to investigate the surroundings. I don't think my Beagles would respond to this discipline!

Health concerns in the UK are similar to those in the US. I had

questions about vaccination frequency, importance of coronavirus vaccination, nutrition for performance, pad injuries, and neonatal care among other queries.

The ACSMA Board will meet July 24 in Philadelphia in conjunction with the AVMA meeting. The location is being determined currently but will be a nice restaurant in the downtown area. If any member would like to attend, please advise our Executive Secretary, Gail Cook. Her e-mail address is: gailcook@earthlink.net. She will save a seat for you but we need to know your plans ASAP.

This might be a good time to brush up on DNA testing for dogs. The Field Dog Stud Book has begun requiring genotypic identification of breeding dogs and Champions and bird dog breeders who register with the American Field may have technical questions about the process. Also, many bird dog trainers are making their annual trek to the Canadian and Dakota prairies, so this might be a good time to talk to them about first aid kits, special medical needs in remote areas, and veterinary

medical availability in the hinterlands.

Two issues that could be important to veterinarians treating performance dogs were noted in a recent issue of Veterinary Practice News. First, Biopure is curtailing production of Oxyglobin, their substitute for whole blood. For practices that utilize this product, this could mean more demand on your local canine blood bank or donor dogs. In addition, lawsuits have been lodged between competing microchip providers which could have long-term effects on product availability depending on the outcome of the litigation. These are just issues of which we should be aware.

Dr. Ed Aycock has lined up an impressive program for our symposium in Philadelphia, so check you calendar and try to attend if possible. The session is scheduled for Saturday, July 24. Thanks to everyone who has helped put this program together and to those who have submitted articles for the newsletter. Contributions are always welcome, so sit down and send us some of your thoughts. The articles do not have to be technical in nature but rather just of value to the membership.

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Neurologic Rehabilitation - "Jiminy Cricket"

by Caroline Adamson, MSPT, CCRP

Director, Rehabilitation Services

Colorado Canine Sports Medicine/Rehabilitation Clinic, Alameda East Veterinary Hospital, Denver, CO

Jiminy Cricket Mosakowski is a 12-year old, male neutered Clumber Spaniel. His owners have complained of Jiminy's "back problems" since March of 2002. At that time, he presented to the referring veterinarian at Purdue University holding his head down low and with signs of neck pain upon manipulation. He was sent home and improved with a course of steroids and house rest. He was doing well until mid-October when he began knuckling on the left forelimb and was not able to use his right forelimb. This time the condition did not improve with steroids and rest. Late October, his condition worsened and the owners' noticed that he became reluctant and wobbly (ataxic) when ascending/ descending stairs.

Dr. Lisa Klopp, a neurologist at Colorado State University's College of Veterinary Medicine, performed a neurological exam and radiographs were taken. Upon initial presentation, Jiminy was tetraparetic. A CT scan confirmed her diagnosis of intervertebral disk disease (IVDD) in the cervical spine at the C3-C4 level. Dr. Klopp performed a hemilaminectomy surgery on 10/31/02 to relieve the pressure of the disk material on the spinal cord. She reported severe compression down to 10% of the diameter of the spinal cord. In addition to the IVDD, Jiminy suffers from osteoarthritis in bilateral elbows.

Dr. Klopp referred Elaine and Chris Mosakowski to the Colorado Canine Sports Medicine / Rehabilitation Clinic (CCSMRC) at Alameda East Veterinary Hospital (AEVH) in Denver, Colorado. The CCSMRC is housed within AEVH and has a fulltime physical rehab therapist on staff five days per week.

Jiminy presented to the CCSMRC one week after his surgery, on 11/7/02. He was carried in and out on a stretcher and was only able to lift his head. He was unable to sit from left sternal recumbency by himself or even stand and support himself independently and had minimal motion on his left side, with the most motor function at his shoulder. His right side was completely paralyzed and he had moderate bilateral forelimb and hindlimb muscle atrophy (R > L). He required maximal assistance of two people to support him while standing, but was knuckling on his right side. He was dependent with all transfers and was unable to flip himself from side to side. He held his head low and was reluctant to actively extend his neck. He was only able to support himself in right sternal sitting for no more than four seconds, indicating weak trunk musculature.

Jiminy boarded at the CCSMRC for a week at a time in order to pursue intense rehabilitation. His rehabilitation plan of care included daily hydrotherapy to strengthen his cervical extensor and trunk muscles and to maintain and re-educate what motor function had remained on his left side. Initially, water levels were raised and lowered repeatedly to encourage 5-10 repetitions of side-sitting from a lateral recumbent position. Water levels were also filled to just under chin level, then slowly raised to strengthen cervical extensors. Water temperature was maintained between 85-90(F) and a "Fido Float" was worn by Jiminy to provide support in the water. Electrical stimulation was performed daily on his right forelimb and hindlimb (triceps and quadriceps, respectively). Therapeutic exercise began with proprioceptive training to include weight shifts and repeated "sink-to-stand" exercises. This required Jiminy to support his weight on all four limbs, with maximal assistance at first. As he gradually "sunk" down into a sitting position, his legs were raised back to a standing position. This exercise was repeated numerous times over the course of a day. A therapball was also utilized to improve trunk stability and neck range of motion into extension. Jiminy was asked to reach for treats while positioned over a ball. In addition, he was rotated in all planes and encouraged to move himself back to midline to increase trunk strength and stability. Jiminy's owners were given a home exercise program, to include transferring from sidelying to sternal, standing and supporting his weight with feet flat and encouraging him to lift his head. As he progressed, transferring from sternal to sitting was added to his home program. This allowed for continuity of care and provided his owner's with activities to do at home.

Rehabilitation was progressed and continued through mid-December. Over a period of 4 weeks, Jiminy improved by leaps and bounds. After one week, he was turning himself from side to side independently. By the end of week two, he was able to sit from sidelying to sternal by himself and minimal voluntary motor function was visible. He was starting to push himself up using his forelimbs from a sternal position into sitting. At the end of November and early December, he was able to support himself in standing and began taking a few steps. In mid-December, he was independent with all transfers and walking by himself. At this time, Jiminy's primary limitations included not being able to ambulate on hardwood and slippery floors and difficulty supporting his body weight when defecating. Despite these limitations, Jiminy continued to improve.

As of January, 2003, Jiminy's condition has returned to near normal. He is able to ascend/descend stairs and can support himself and posture to eliminate independently.

**Though a graduate of an accredited Master of Science in Physical Therapy degree program and the holder of a physical therapy license in the states of Colorado and Pennsylvania, Carrie is unable to call herself a 'physical therapist'. Colorado's legal definition of a physical therapist is a person who is licensed to practice physical therapy. In turn, physical therapy is defined as the examination, treatment, or instruction of human beings to detect, assess, prevent, correct, alleviate, or limit physical disability, movement dysfunction, bodily malfunction, or pain from injury, disease, and other bodily conditions. Thus, due to the specific use of the terms applied to humans, the State of Colorado Physical Therapy Licensure Board has requested that Carrie not use the terms 'physical therapist' or 'physical therapy' when working with animals.*

A Surgeon's Experience (TPLO)

Continued from page 1

males and 49% females. The mean weight was 84.4 pounds.

A standard medial arthrotomy was performed in 14% of cases, a medial meniscal release incision in 81%, with a subtotal medial meniscectomy in 5%. No joint invasion in 6% of cases. This included dogs with partial CCL rupture with no cranial drawer.

Complications were defined as any undesirable outcome associated with the surgical procedure. They were broken down into intraoperative, short-term (from post-anesthesia recovery to 14 days), and long-term (15 days-30 months postoperative).

Intraoperative complications were rare: 4 (1/2 %). These included hemorrhaging from elevation of the caudal muscle group (2), a small chip fracture through the trans-cortex of one screw hole (1), and a broken screw head in the proximal hole of the plate (1). All of these were managed with minimal difficulty.

The short-term complications usually involved swelling/bruising of the incision site. The other things seen were self trauma by the patient, or premature removal of the staples. Initially, a bandage was applied post-op to help with these problems. We found that the bandage slid down the leg and bunching at the bend of the hock produced pressure sores. After a few cases, we abandoned the placement of a bandage and started cold compresses. This dramatically

reduced the short-term complications. Soft tissue infections were noticed in 5 cases. These all responded to antibiotic therapy.

The long-term complications were as follows:

- Patella tendon swelling (25)
- Tibial tuberosity fracture (10)
- Fibula fracture (6)
- Screws loosening or backing out (5)
- Tibial fracture (2)
- Broken plate (1)

The majority of these cases required no surgical intervention. Fig. 1 shows a 4-year old Mastiff, 3 weeks post-op with a fractured fibula and the plate and screws pulling off. The dog jumped out of a truck. The plate was reapplied and a fixator stabilized the lateral aspect of the tibia.

All tibial tuberosity fractures were treated by enforced rest. If a fibula fracture occurred intraoperatively or within the first three weeks post-op, an external fixator was applied to the proximal lateral tibia. This supported the lateral side of the limb while the fibula healed.

In over 600 cases, only 6 required a second surgical procedure:

- Tibial fractures (2)
- External fixators placed for fibula fracture (2)
- Plates removed for loosening of screws or infection (2)

Fig. 2 shows a 6-year old Mixed breed dog that fell down a flight of stairs 2 weeks post-op. A fracture of the tibia distal to the

plate was stabilized with multiple cerclage wires and K-wires.

By grouping the complications into major and minor, we were better able to assess their clinical relevance.

Major complications requiring re-operation or ongoing treatment that could affect successful outcome occurred in 1.5% of the cases. All of the cases but one returned to a good level of activity.

My conclusions from reviewing this data in over 600 TPLO surgeries is that the significant complication rate is no higher than with any other major orthopedic procedure. It is a technically demanding procedure with a steep learning curve. The majority of dogs had sufficient healing of the osteotomy to return to low impact activity by 8 weeks post-op. The rehabilitation program is very important with this procedure.

As a surgeon with 34 years experience, I am now able to expect canine athletes with CCL rupture undergoing the TPLO procedure to return to a high level of competition. This was not the case in most dogs with either intracapsular or extracapsular stabilization techniques used in the past.

Figure 1

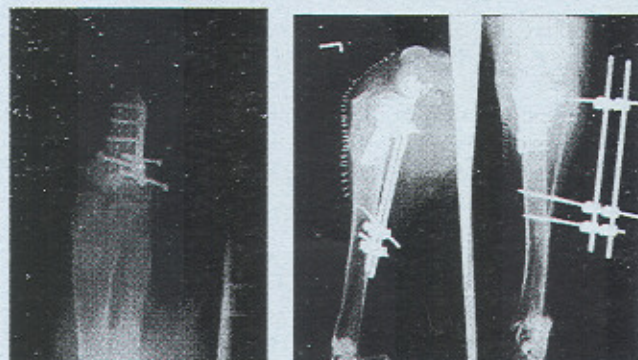


Fig 1
Before fixator

Fig. 1
After fixator

Figure 2

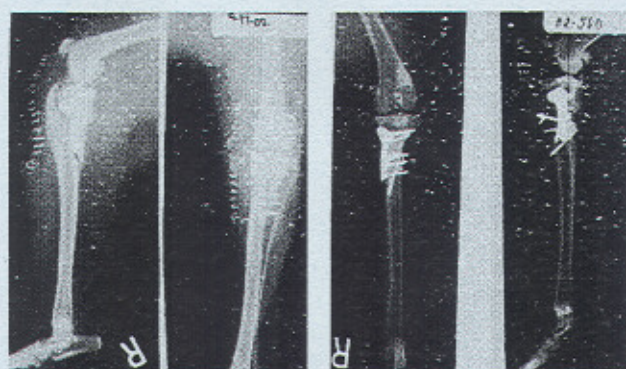


Fig. 2
Before wiring

Fig 2
Plate stabilized with
cerclage and K-wires