Efficacy of Triple Pelvic Osteotomy in Canine Hip Dysplasia

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Abstract

Canine hip dysplasia is an affection which affects the locomotion of the animal very clear and severe. Genetical factors and others (miopathy, painful diseases associated with canine hip dysplasia, neuronal disfunction, exaggerated elasticity of the pectineu muscle) are known to be the cause of the disease.

We could also blame the feeding habits for growing puppies. During the growth period, an excess in fatty food can cause a beginning for canine hip dysplasia and other bone diseases. It is know that canine hip dysplasia affects most of the time large breed dogs. In our study we wanted to check the efficacy of the triple pelvic osteotomy (TPO) operation in unilateral canine hip dysplasia grades 3 and 4.

We took 5 dog breeds into consideration, with different gender and age, varying from 6 months to 1,3 years. The diagnostic was made observing the clinical signs and X ray findings. For the stabilization of the cut bone segment we used specific plates for osteosynthesis with different angles. Post operation, dogs were followed for 10 days and checked for their vital signs as well as local modifications and started using the affected limb 11 days after the operation.

Keywords: *dog, hip dysplasia, triple pelvic osteotomy*

INTRODUCTION

Canine hip dysplasia is a multifactorial disease which affects all large breed dogs (Everts *et al.*, 2000). It is characterized by a congenital deformation of the hip socket (Sewell, *et al.*, 2009) followed by an exaggerated laxity of the joint in young dogs and can develop to degenerative joint disease in the adult (B.D. Rocha *et al.*, 2007). Clinical signs may vary from a light instability of the hind limbs to the patient refusing to move (Ohlerth *et al.*, 1998). The diagnostic of the disease can be made by clinical examination, palpation and X-ray (Ginja MMD *et al.*, 2010). The goal of the present study was to appreciate the efficacy of TPO in canine hip dysplasia depending on the time of intervention, age and time of healing.

MATERIAL AND METHODS

Our study was conducted during 2011-2012 on a number of 5 dogs of different breeds (Labrador, Rottweiler, Golden Retriever, Rottweiler mix) with the age between 6 months and 1,3 years. The 5 subjects were diagnosed with canine hip dysplasia grade 3 and 4 (Demko *et al.*, 2005). We used standard orthopedic surgical equipment along with Synthes metal plates specially designed for the TPO procedure (Schultz K.S. *et al.*, 2003). Each plate was characteristic to the grade of dysplasia (Andersen S. *et al.*, 1988). For the surgical intervention dogs were prepped before surgery with a 12 h diet and 30 minutes before starting the surgery, they had a premedication with Atropine 0,15 ml s.c., Medetomidin 20 µg/

kg i.m and Ketamine 5mg/kg. The patients were intubated and general anesthesia was maintained with the use of Isofluran 2% (Malm S. *et al*, 2007).

The triple pelvic osteotomy procedure implies osteotomy procedures at the 3 bone segments for repositioning the pelvic socket. The patients were first positioned dorsally to have a better work space at the level of pubis. After the incision of soft tissues, the pectineus ligament was cut and pubis osteotomy was performed (Fig.1) followed by the closing of the operation. For the ischia osteotomy we performed an incision of the soft tissues located at the middle distance between the posterior ischial and lateral limit of the ischiatic arch. With the help of an osteotome we cut the caudal surface of the ischia (Fig.2) and we checked to be sure the incision was made properly.

The dog was placed on his lateral side and a 5 cm incision of the soft tissues was made, until the ilium was isolated. After this step, the osteotomy of the ilium was performed (Fig.3). To check

the mobility of the cut bone segment, we used a Kern forceps applied at the ischia and rotation movements of the segment were made. The Synthes plate is then fixed on the segment with 6 screws (Sarierler M *et al*, 2012) (Fig. 4).

RESULTS AND DISCUSSION

The acetabular socket, the femur head, the capsular ligament, the round ligament and synovial membrane form a complex and very stabile joint. If one of these components are not functioning well, the socket is predisposed to a severe pathology (Hara Y. *et al*, 2002). The stabilization elements are widened, sometimes torn which can offer the femur head an increased movement (Lust G. 1997). From a dynamic point of view, this mobility extends past the physiological limits and produces a repeated trauma with immediate effect on the joint cartilage and synovial membrane with vascular changes, nutrition disorders of the bone and cartilage and degenerative joints (Todhunter

Fig.1. Pubis osteotomy

Fig.2. Ischia osteotomy

Fig.3. Ilium osteotomy

Fig.4. Attaching the plate

RJ *et al.*, 2003). Arthritis and arthrosis are very likely to appear and especially osteophytes which reduce even more the joint mobility. It is the reason why this disease is more and more studied. In the present, there are two solid options for canine hip dysplasia: TPO and total hip replacement (American College of Veterinary Surgeons 2008). Total hip replacement offers a more simple surgical intervention and accuracy in the correction of the joint angle because they are designed according to breed, weight, age and age of the disease. TPO requires a more elaborate work volume, the joint angle is calculated with the Norberg technique (Brass W, 1989) the surgical act is represented by a triple osteotomy and the repositioning of the femur head is not always the one desired by the surgeon. In our cases, the dogs suffered from canine hip dysplasia grade 3 and 4, this being the reason to check for the efficacy of the TPO technique. Applying the technique 5 times with 5 successful operations, we can say the method is very efficient and offers a quick healing post operation. The most critical point of the operation remains the rotation of the cut bone segment. The surgeon has to be in perfect synchronization with the other surgeon so that the Synthes plate is placed. Another signaled aspect in our study was the distance between the cut bone segments. In our study we found out that 2 or even 3 mm are needed so that the bone segment will be more easy to maneuver. Rotating under pressure can lead to cracks or even fractures. Because our patients were heavy, we offered an increased stability to the bone

Fig.5. Post operation X-ray

segment by inserting a cerclage at the end of the ischia. At all cases, we performed a post operation X-ray to confirm the correct insertion and fixation of the plate. Post operatory, the patients received a pain management protocol (Metamizol 1000 mg, Amoxicilin 15mg/kg s.c.). During the recovery phase, in the first three days the patients preferred not to walk or use the other three limbs. At day 11 post operation they start to put the leg down and at day 20 they could use it completely. We did not encounter any complications in our patients.

CONCLUSIONS

TPO offers good results when treating canine hip dysplasia (7-20 days after the surgery the patient can use the operated hip). The surgical intervention has to be made as fast as possible to avoid degenerative changes in the joint. For the recovery of the patients, they need to be observed for 10 days and helped in any situation where they would need to use the affected limb.

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