**Conclusions**

Arthroscopy has appeared as an important breakthrough for the veterinary orthopaedist, just as radiology or the CT scan have been for the radiologists. Nowadays, the diagnosis of articular diseases has been refined, such as the diseases of the shoulder joint, and many surgical procedures are done using minimally invasive arthroscopy. Arthroscopy results in less surgical morbidity, less post-operative pain and faster recovery. Multiple joints maybe treated on the same day. The future of arthroscopy is bright in Small Animal surgery. More veterinarians will be able to practice the technique, more articular diseases will be treated under arthroscopy and many more smaller joints will be explored arthroscopically.

**Further reading**


**Author’s Profile**

Dr. Matis qualified from the University of Munich in 1972, where she received her Dr. med. vet. degree in 1972 and her Dr. med. vet. habil. (PhD) in 1978. She is currently Professor of Surgery and Head of the Clinic of Surgery (including Ophthalmology and Radiology) at the Ludwig-Maximilians-University of Munich. Prof Dr. Matis was President of AO Vet International (1996–1998) and President of the European Society of Veterinary Orthopaedics and Traumatology (1998–2000). Since 2003 she is President of the European College of Veterinary Surgeons. In 2001 she received the WSAVA-Sabi-Paishama International Award. Prof Dr. Matis has published numerous articles and textbook chapters in the field of companion animal surgery. She is co-editor of two textbooks. Her primary areas of interest include small animal orthopaedics and traumatology, computerised gait analysis and imaging techniques.

**State of the art JOINT REPAIR in VETERINARY MEDICINE**

**Introduction**

Joints allow flexibility and movement of the body. They absorb shock and provide stability during motion and weight bearing. Diarthroses, or synovial joints, provide the greatest movement and are the site of most joint diseases in animals. It is estimated that approximately 20% of all dogs suffer from osteoarthritis. Radiographs of older cats also commonly show degenerative joint lesions. However, in contrast to dogs, such degenerative changes are rarely clinically apparent in feline patients. While in the cat the aetiology of joint disease is mainly traumatic, developmental and degenerative joint diseases are becoming increasingly more important in the dog. In 2003, American dog owners spent as much as 1.32 billion dollars (1.08 billion Euros) in surgical repair of ruptured canine anterior cruciate ligaments." Calls for preventive measures such as strict selection of breeding stock and balanced restrictive nutrition are hence becoming more and more important.

**Traumatic Joint Disease**

Reconstructive surgery still represents the treatment of first choice for traumatic joint diseases and particularly for articular fractures (figs 1a, 1b and 1c). Early anatomically correct and stable reduction of fragments, and application of careful soft tissue sparing preparation techniques, are mandatory for re-establishing joint congruency and also for rapid mobilisation. Yet, a poor outcome and osteoarthritis may occur even when the principles of joint fracture repair are carefully adhered to. Long-term results of 120 cats and 190 dogs with surgically treated articular fractures of the
breakthrough (figs 3a and 3b). Controlled studies show that TPLO is superior to conventional techniques. To satisfy the principles of evidence-based medicine, studies that include and document radiographic follow-up examinations are required to determine whether Tibial Tuberosity Advancement (TTA), a technique that has been advocated only recently, yields equally good results. With TPLO, the incidence of post-surgical arthrosis is lower than with conventional techniques, and there are observations indicating that arthrotomy and meniscal release are not necessary in most cases when TPLO is performed. Second look arthroscopies have confirmed that TPLO can prevent a complete rupture in cases of partial rupture of the ACL.

Ligament Trauma

In general, traumatic lesions of the joint capsule and ligaments carry a poorer prognosis than fractures that have been reduced in an anatomically correct and stable fashion (figs 2a and 2b). This becomes readily apparent when comparing hip fractures to femoral luxations.

While the severity of traumatic lesions and precision of reconstruction are of major importance for the outcome of intra-articular fracture repair, joint configuration is an important prognostic factor for long-term results of luxations. Our studies show that the outcome for femoral luxation is best in cases that do not recur after closed reduction. This is due to a more favourable architecture of the hip joint. Whether conservative reposition and hence lower invasiveness is responsible for the lesser risk of arthrosis development is presently still unclear. In dogs, it has become more common to reduce articular fractures under arthroscopic control. However, controlled studies that compare open reconstruction to arthroscopic repositioning of fractured joints have, to the author’s knowledge, as yet not been conducted in veterinary medicine. Retrospective studies on dogs with a fragmented medial coronoid process (FCP) revealed no difference between surgical and arthroscopic joint revisions with regard to the development of post-treatment arthrosis.

Today, lesions of capsular ligaments are mainly treated with the help of suture anchors in order to reconstruct the normal anatomy of soft tissues. However, with regard to surgical repair of a ruptured anterior cruciate ligament (ACL), the results of reconstruction have not been as good as expected. Neither replacement of the ACL by numerous techniques, nor capsulorrhaphy and transposition of the fibular head are able to provide long-term stabilisation of the stifle joint. It was only the tibial plateau leveling osteotomy (TPLO) as a novel therapeutic concept by Slocum that brought a real shoulder, elbow, and knee, that were re-evaluated clinically and radiologically after 5 years, on average revealed an incidence rate of arthrosis of between 40 to 90%; the incidence of lameness was 20 to 40%. In cats, degenerative changes affected mainly the stifle joint, whereas in dogs the hip joint was most commonly affected. The type of fracture and degree of dislocation had a greater influence on the outcome than the time of

Hip Dysplasia

Corrective osteotomies for hip dysplasia were quite popular at the beginning of the 1980’s. However, they are used much less today because they do not prevent arthritic lesions. This is particularly true for intertrochanteric
Excision arthroplasty of the hip joint does not withstand critical review of its outcome by computerised gait analysis when compared to successful implantation of a prosthesis: the latter is clearly superior. However, it is reassuring to have arthroplastic resection as a back-up technique when complications occur after hip replacement. For irreparably damaged hips in cats, excision arthroplasty is still a recommendable treatment option.

Elbow Disease

A cemented elbow prosthesis has recently become available. Demand for a replacement of this joint has increased ... prosthesis and the duration of post-operative assessments is at the present time too short for a conclusive evaluation.

Diseases of the stifle

A stifle prosthesis will also soon become available. Although total stifle replacement is not indicated as frequently as hip replacement, and the requirements are similar to those of elbow replacement. Thus, procedures aimed at joint preservation will remain the first line of treatment in the near future. Arthrodesis is much better compensated in the stifle than in the elbow, but not nearly as well as arthrodesis of the carpal and tarsal joints.

Summary and future developments

Future studies are required to determine whether it is possible to reduce the enormous use of nonsteroidal anti-inflammatory drugs by techniques for joint preservation such as osteochondral autografts, cartilage cultures and autografts, stem cell technology and gene therapy. It is also necessary to determine whether these techniques will increase mobility of arthritic joints in the long term. From a rational viewpoint, these techniques are not likely to be successful in an environment of destructive processes which occur in elbow and hip dysplasia.

References


Introduction
Recently the great progress in the surgical and conservative treatment of patients suffering from joint diseases has created a demand for additional therapies with special regard to post-operative rehabilitation as well as to the conservative treatment modalities available. In humans the methods of physical therapy and therapeutic exercises are an integral part of rehabilitation after surgery as well as conservative treatment options for patients suffering from orthopaedic and neurological disorders. In recent years a lot of physiotherapeutic methods used in human medicine have been adapted to companion animals. And, researchers all over the world have performed numerous studies to prove the benefits of physiotherapy in small animals.

Goals of physiotherapy
For our patients, especially for dogs suffering from orthopaedic disorders like osteoarthritis, veterinarians as well as the pet-owners feel a need for therapeutic modalities which are appropriate for the long-term treatment and which provide possibilities to improve the quality of life in these patients. The goals of physiotherapy for companion animals suffering from orthopaedic mobility disorders are:

- Pain management
- Improvement in the range of motion (ROM) of affected joints
- Maintaining and rebuilding muscle mass
- Strengthening of muscle force
- Improvement of the overall body condition
- Weight management of overweight patients