

A literature review: physiotherapy of the hip after septic arthritis

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Abstract

Introduction. Septic arthritis is one of the most common osteo-articular infections encountered in pediatric orthopedic pathology. Due to the difficult diagnosis and secondary complications of late diagnosis and a late-established treatment, recovery of these patients is very difficult, and long-term outcomes are not always the best.

Materials and methods. We used the electronic databases and selected articles that had as main topic recovery and rehabilitation after septic hip arthritis and evaluation methods of treatment.

Results. The start of physiotherapy and recovery and rehabilitation treatment after medical or surgical treatment has not yet been accurately established. Various manual handling techniques, muscle stretching exercises, and articular mobility enhancement exercises aim to improve the quality of life of patients with septic osteoarthritis.

Conclusion. A good collaboration between the orthopedic surgeon and the physiotherapist will lead to a good functional result and the ultimate goal of this collaboration is a life as close to normal as possible for the patient.

Key words: *septic hip, septic osteoarthritis recovery, patients rehabilitation*

Introduction

Septic arthritis represent an infection of the synovial joint caused by a pyogenic bacteria (1). The occurrence of septic arthritis can be determined by the transmission by blood of the lesion of a distant infectious outbreak from a proximal femur osteomyelitis or by direct inoculation in the case of an articular trauma or intra-articular invasive maneuver (2,3). It is well known that the prognosis of septic arthritis in children is associated with joint affected, age of diagnosis, treatment delay and the organism responsible (4). Cartilage destruction starts after 8 hours of the infection (5). Males are more affected and large joints are more involved (6). Delayed in treatment or untreated septic arthritis can spread to the underlying growth plate, causing destruction of the physis with consequent loss of growth or tethering of the plate causing deformity (7). Joint infection can also spread to the adjacent bone and cause osteomyelitis (8). Staphylococcus aureus is the most common bacterial pathogen found in the joint aspiration fluid and the most important symptoms are: joint pain, fever, periarticular edema and warmth, and decreased range of motion (9). The most involved joint is the hip and has the worst prognosis of all. In neonates and infants diagnosis is difficult to establish because all clinical signs are dimmed, initially laboratory test are all most normal and imagistic exploration are difficult to interpret.

Objective The purpose of this study was to evaluate postoperative conduct and to initiate recovery, rehabilitation and physiotherapy treatment in patients with hip septic arthritis.

Material and methods

Search strategy

We used electronic database MEDLINE (Medical Literature Analysis and Retrieval System Online) through PubMed interface and Google Books search engine. The keywords and Medical Subject Heading (MeSH) terms used were: septic hip rehabilitation, physical therapy in septic hip, osteoarthritis recovery.

Inclusion and exclusion criteria

Inclusion criteria were: full text articles, septic joint hip recovery, articular rehabilitation exercises, physical therapy in pediatrics orthopedics and exclusion criteria were studies about adult hip pathology.

Results The prognosis of septic arthritis of the hip in children will vary depending on the time of diagnosis and treatment. Diagnosis may be difficult to establish in neonates and infants because clinical signs are fewer and less pronounced. The most important symptoms are: crying when a joint is moved, such as during a diaper change, inability to move the limb of a joint, swelling and redness, irritability, fever, persistent crying for any reason (10). There is a sample of a diagnostic protocol for septic arthritis made by Morrey which can help us to save time for a quickly diagnosis (11).

Table 1. Morrey's Diagnostic Criteria for Septic Arthritis

CRITERIA	CONDITION
Major criteria (at least 2 conditions)	Pus aspirated from the joint
	Marked elevation of the erythrocyte sedimentation rate
	Specific roentgenographic changes in the involved site
Minor criteria (at least 5 conditions)	Fever greater than 38.3°C
	Pain (localized to the joint) made worse by gentle passive motion
	Swelling of the involved joint
	Systemic symptoms of lethargy, malaise, irritability
	No other demonstrable pathological process
	Satisfactory response to antibiotic therapy

There are several risk factors that may influence the occurrence of septic arthritis of the hip : increasing age, history of infection of any kind, autoimmune conditions such as Systemic Lupus Erythematosus, scleroderma or mixed connective tissue disease, diabetes, sarcoidosis, human bite or tick bite, fracture, central line placement, indwelling catheter, immunocompromised condition, recent immunization, malnutrition, skin breakdown (12).

Differential diagnosis can be made with other pathologies which shows also articular symptoms such as: transient synovitis, HIV infection, Lyme disease, gout, and lupus (13).

Treatment consists of specific antibiotics, arthroscopic drainage and surgical drainage. Reasons for delay in treatment may be attributed to inappropriate early antibiotic management and incorrect primary diagnosis (14).

Final treatment results can be evaluated using radiologically grading system of Bennett and Namnyak.

Table 2. Bennett's Radiological Grade (15)

Grade	
I (excellent)	Normal
II (good)	Minimal distortion of trabeculae
III (fair)	Coxa magna with or without shortening and thickening of femur neck and coxa valga or vara
IV (poor)	Joint space narrowing
	Avascular necrosis of proximal femoral epiphysis
	Complete destruction of joint

The most common complications are: premature closure of the triradiate cartilage, premature closure of the proximal femoral physis, limb length inequality, subluxation, dislocation and complete destruction of the femoral head and neck (16).

It is very important that medical treatment be started as quickly and correctly followed immediately by surgical treatment. Once it has been introduced antibiotics and surgical decompression was performed can start gentle joint mobilization from day five after surgery (17).

Unfortunately, medical literature provides little information about rehabilitation after septic osteoarthritis, as medical treatment is different depending on the time of diagnosis, patient age, and degree of joint damage. A diagnosis and medical, surgical and physiotherapeutic treatment initiated at the right time means an excellent hip joint if it has normal ROM, and there is no limp and no pain (18,19).

Due to the articular changes described above a special role is also the physical treatment of recovery and rehabilitation of patients to prevent joint redness, muscle atrophy, and the patient returns to a high level for daily living. For initial examination of the patient it can be used HOOS score which includes evaluation of the symptoms, stiffness, pain, daily living, sports and recreational activities and quality of life. The affected joint is initially immobilized to prevent subsequent joint damage and to control patient pain due to the mobilization of the affected joint.

After surgical treatment, Donatto recommended initial immobilization and splinting to prevent joint contractures and active or passive range of motion to prevent joint contractures and maintain cartilage integrity after surgery (20). Ogilvie-Harris and Al Thani maintain that aggressive physical therapy after soft-tissue surgery had a good result (21).

It is important to know the patient history, what kind of treatment was applied, evolution of the illness and treatment evaluation. In pediatric orthopedics all the information we get from the parents. The level of recovery of the joint involved is determined by the degree of joint damage which can be evaluated using Bennett and Namnyak radiologically grading system. Pain evaluation can be made with a 0-10 numeric written scale at the start of the physical therapy, and patient can describe the nature of the pain, where is she located in the hip region and how the pain limits his daily activity or interferes with the rest program.

Initial evaluation includes active range of motions measurements using goniometer, passive range of motion evaluation, selective muscle tension testing using isometric tests, evaluation of the length of the muscle using Thomas test, strength test, movement analysis and gait analysis, how to dress or undress, how to put your socks or stretch. Hip pain caused by muscular isometric tests suggests an inflammation of the joint, being caused by the compression of the joint due to muscle contraction.

After the initial examination, the therapist explained to the patient that full recovery is possible or might not be possible. Physical therapy is a long-term treatment and is important to develop a therapist-patient relationship and education, which include information about medical diagnosis and planned therapeutic interventions. Depending on the degree of joint damage physiotherapy includes multidirectional stretching in cardinal plane motions maintained at end range for 10 to 20 seconds to patient's tolerance and active-assistive range of motion of the lower extremity, self distraction of the affected hip for two or three minutes in long-axis of the limb. In the case of patients who have been immobilized for long periods of time, they can also introduce weight change exercises, lifting the heel, lateral passage and preparation for walking between parallel bars. The patient is instructed in proper performance of a program home, which included active and passive hip stretching according to his tolerance. Hip extension exercises are recommended three times a day for five minutes each also is recommended contract-relax stretching exercises for iliopsoas and hamstrings. The treatment also includes manual therapy techniques, specific directional glides, early repetitive passive range of motion for the potential effect of articular surface regeneration. When a joint resistance to mobilization is met, manipulation techniques may also be used under anesthesia followed by the resumption of activity initiated up to that point, with an emphasis on increasing the joint's amplitude of motion (22,23).

Pedaling a recumbent bike is initiated before stretching and manipulation with intent to increase circulation and tissue elasticity for maximal stretching effect. In patient with limited hip flexion postural education is provided to correct a kyphotic posture. Can be use also electrical stimulation with intermittent isometric contractions during a 20-minute periods. The goal of the physical therapy is to increase

joint range of motion and to normalize gait and function. To increase range of motion of the hip can be use lumbosacral orthosis during stretching and mobilization, because the orthosis increase stabilization of the lumbar-pelvic region in order to better isolate stretching in the hip region. Using lumbosacral orthosis can be associated with different techniques of hip distraction (22). Assessment of recovery treatment and physiotherapy can be done by measuring the hip joint motion by applying the HOOS and Harris functional tests.

Conclusions

Diagnosis and treatment of septic arthritis of the hip in a short time remains a difficult one. Surgical treatment of sequelae of septic osteoarthritis remains still an attempt for most surgeons and does not always yield the desired functional result. The collaboration between orthopedic surgeon and physiotherapist may increase the chances of recovery as close to that of a normal joint as possible with the development of normal daily physical activity and a life without too many physical limitations.

Conflict of interest

The authors declare that they have no conflict of interest.

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