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A Child with a Limp – A Clinical Approach

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ABSTRACT

Limp is a common presentation in Paediatrics. Fortunately for the majority it will represent a benign problem that settles with minimal or no intervention. It may be as simple as poorly fitting new shoes or a verruca. However, in amongst the self-limiting problems are relatively rare but potentially devastating diagnoses such as joint infection or malignancy. To have a reasonable chance of picking up on these at an early stage requires a thorough approach to every limping child. This article will review the key points that are important to consider when approaching a child with a limp.

Key Words: paediatrics; orthopaedics

Introduction

Limp is a common presentation in Paediatrics. Fortunately for the majority it will represent a benign problem that settles with minimal or no intervention. It may be as simple as poorly fitting new shoes or a verruca. However, in amongst the self limiting problems are relatively rare but potentially devastating diagnoses such as joint infection or malignancy. To have a reasonable chance of picking up on these at an early stage requires a thorough approach to every limping child.

History

As with every consultation we start with a good history, but there are some questions that are particularly pertinent to explore:

Any recent history of trauma and the mechanism?

Trauma is a common cause of acute limp in children. Sometimes parents may try to make sense of the limp by attributing it to a recent fall when the fall may simply be incidental or the child had a tumble because he is unwell. Active children have frequent minor tumbles. There is a danger in attributing a limp to this, missing a potentially significant diagnosis such as osteomyelitis. Equally children do sustain bony injury with sometimes relatively minor falls. Trampolines are often involved when there is bony injury. Plain xrays of the affected area including the joint above and below in two planes are often reasonable in this context. The other complicating factor is that there may have been significant trauma that has not been witnessed in younger children. The spectre of non-accidental injury should always be borne in mind and advice sought appropriately if there are concerns.

Duration and progression of the limp? Time of the day when limp is worse? Has the limp interfered with normal activities?

A limp that is not settling within a week or so and a limp that is getting worse or interfering with normal activities requires Specialist assessment to exclude significant pathology. Constant pain unrelated to exercise also suggests significant underlying pathology such as tumour. Mechanical pain experienced only on exercise suggests a more benign diagnosis. Pain and stiffness in the morning which improves with activity suggests possible joint inflammation and Juvenile Idiopathic Arthritis should be considered.

Can the child weight-bear?

Inability to weight bear makes significant pathology more likely, as does the presence of systemic symptoms such as lassitude, fever or weight loss. Any accompanying weakness is also a red flag.

With the younger children that present with a limp I often think that this is what it must be like working as a Veterinary Surgeon. An incomplete history and an uncooperative patient pose a significant challenge. This is where your skills of observation come in. Admission to the Ambulatory Unit for a few hours can be very helpful. It allows the child to settle in comfortable surroundings, gives an opportunity to repeat observations and temperature in particular. I tend to have a low threshold for doing bloods and this allows time for the Ametop to work adequately, the play therapist to engage the child and for the lab to process the samples. You may well develop an idea how the child is affected by the joint pain. For example, are they running around while you speak to the mother or still and crying on her knee?

Examination

The examination genuinely needs to be top to toe although undressing the child may have to done in stages to avoid distress. You may have to examine the younger child on his parents lap rather than on the couch. Any abnormal pallor or bruising should be noted and acted on appropriately. A thorough assessment of all joints can pick up on unsuspected other joint involvement in a case of Juvenile Idiopathic Arthritis. The pGALS approach is helpful in this respect.[1]

Careful palpation of the abdomen is important. Intra abdominal pathology such as an inflamed appendix can cause hip pain and irritability if it lies retrocaecally on the iliopsoas or obdurator internus muscles for example. Hernial orifices and testes in boys need to be assessed as they may be the source of the limp. The spine should be checked to ensure that it is straight and supple.

Investigation, Differential Diagnoses and Management

An experienced senior clinician may choose not to necessarily do any bloods in a limping child if he / she is confident that there is no sign of anything concerning. However, as a Junior Doctor it is reasonable to have a low threshold for doing bloods in this context as they can be helpful in excluding significant pathology.

A normal blood count and normal inflammatory markers can be very reassuring. About a third of children with acute lymphoblastic leukaemia present with musculoskeletal symptoms such as limp or back pain. A blood film may not show blast cells early on in the illness. A generalized cytopaenia with low haemoglobin, white cells and platelets is concerning and suggestive of bone marrow infiltration. Urgent discussion with Haematology is appropriate. With milder abnormalities such as isolated slightly low neutrophil count (which can often be a post viral phenomenom) repeating the blood count and film a week or so later may be all that is required.

The hip is often the site of pathology in children. The commonest cause of acute atraumatic limp in children is transient synovitis of the hip.[2] With hip pathology in children the pain is often referred to the thigh or knee. Younger children may not be able to localise the pain and simply limp or refuse to weight bear. The important differential diagnosis in this context is septic arthritis of the hip. Transient synovitis of the hip is generally a very benign, self limiting problem that responds to rest and analgesia. Septic arthritis on the other hand is a very serious infection requiring early and aggressive management to save the hip joint. "Kocher's criteria" are helpful in trying to home in on those children that are more likely to have bacterial sepsis causing their hip irritability.[3] Significant pyrexia, inability to weight bear, raised white cell count, and raised inflammatory markers are all features that raise the concern about possible septic arthritis in this context. C reactive protein (CRP) is more helpful than erythrocyte sedimentation rate (ESR) or plasma viscosity (PV) as it is often raised within hours of significant infection and also normalises much more quickly as the child recovers / responds to treatment.[4] An ultrasound examination will help localise the problem by confirming that there is fluid in the hip joint but it will not be able to tell you whether the fluid is infected or not.[5] A suspicion of bacterial infection in this context requires the hip to be aspirated under general anaesthesia to clarify. Finding pus in the joint will require aggressive surgical management to wash out the joint as well as high dose intravenous antibiotics.[6]

In younger children with an acute "irritable hip" xray examination is generally not needed at initial presenation. Failure to completely settle within a few weeks is an indication to xray in this context to look for other hip pathology such as Perthes disease. In children older than eight years it is reasonable to xray at initial presentation to look for slipped upper femoral epiphysis (SUFE).

The radiological signs of a SUFE on a standard AP Pelvis for hips can be very subtle. A frog leg lateral of both hips is also indicated in this age group[7] and a SUFE is much easier to pick up on this view. Some centres are now simply doing a frog leg lateral view of both hips and not necessarily doing an AP pelvis to minimise radiation dosage.

A common problem that can present with limp in preschool children is a "toddler's fracture". This can occur with minimal or no trauma, perhaps just a simple twisting injury during normal play activities. It typically causes a spiral fracture of the distal third of the tibia. The child will be reluctant to weight bear but will be happy to mobilise on his / her

knees crawling. There may be tenderness over the distal tibia. The big differential diagnosis here is osteomyelitis. A normal temperature, normal bloods and a well child will help reassure you that infection is unlikely. Xrays may initially be normal. It is a clinical diagnosis. If suspected and infection confidently excluded treatment is with a long leg (above knee) plaster. The child should be reviewed within a few days and if you are right he should be comfortable and confidently mobilising in the plaster cast. All going well the cast is removed at the two week mark. Xrays are repeated at that point. Sometimes the repeat xrays are normal and the child is happy mobilising out of the cast. If the repeat xrays show a fracture line or suggest a healing fracture with periosteal elevation then a further long leg cast should be applied for a further three weeks or so.

Plain xrays are poor at picking up early osteomyelitis but should help in excluding significant lesions such as primary bone tumours. Magnetic Resonace Imaging MRI scanning can be very helpful if there is diagnostic uncertainty and is very much the “gold standard” but requires anaesthesia in most preschool children. A skilled Paediatric Radiologist will be able to help clarify a suspicion of osteomyelitis with high resolution ultrasound avoiding the need for anaesthesia and will be able to tell you if there is any joint involvement or a collection of pus needing surgical drainage.

Radioisotope bone scanning is now rarely used because of concern about the total body radiation dosage. It has the advantage over MRI that it can be done without sedation / anaesthesia. It can be helpful in cases where you are struggling to localise the site of the suspected pathology but it is fairly non -specific. A hot spot could be inflammation, infection, tumour or trauma.

Transient synovitis typically affects the hip. The hip is very rarely the first joint to be involved in Juvenile Idiopathic Arthritis (JIA). A swollen knee with fluid / synovitis on the other hand is less likely to be transient synovitis and you should have a low threshold for urgent Rheumatological referral. The formal diagnosis of JIA is joint inflammation not settling within six weeks but it is important not to wait this long before onward referral! Refer early as specific treatment under the care of a Rheumatologist can prevent significant joint damage. The other important reason to refer early when JIA is suspected is because the child can have a significant asymptomatic uveitis as part of the condition which requires slit lamp examination to diagnose and early aggressive treatment to save sight.

The diagnosis of JIA is made clinically. Ultrasound can be very helpful in clarifying joint involvement. In many cases the inflammatory markers can be normal at least initially. Serology such as Antinuclear antibody (ANA) and Rheumatoid factor (RhF) are helpful in the setting of the Rheumatology clinic but should generally not be done as part of the initial work up of a limping child.

A frequent dilemma is a limping child with no constitutional symptoms and no localized abnormalities by history or physical examination. Consider using plain films to rule out a fracture, followed by observation and re evaluation in a few days, depending on the severity of the limp and the family situation. Consider checking FBC / film and inflammatory markers

to out rule infection. A bone scan may be helpful after two to four weeks if symptoms do not resolve or localize.

Conclusion – Key Points

To finish, a couple of keypoints:

1) Bone / joint infection and malignancy (bone tumours and leukemia) are fortunately rare but potentially life-threatening, and should be ruled out as quickly as possible as the cause of a limp by appropriate investigations. For the majority reassurance and rest / analgesia with early review will be appropriate.

2) Hip pathology is notorious for presenting as knee or thigh pain, and must always be considered in patients with these complaints.

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