

# “ClinicO-scOPe” (Clinic On Some Common Orthopedic Pregnancy Related Problems Explored) - A Must Know in Orthostetrics

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## Abstract

Pregnancy is an essential physiological state in almost every life of a woman. Although, pregnancy on one side is desired voluntarily and brings joy to the woman in the form of attaining the motherhood, has been found to have a bag of some inherent problems peculiarly related to this physiological state. It can add misery and morbidity during this otherwise wonderful gift of nature to woman. Orthostetrics is an evolving field which deals with the orthopaedic problems in pregnancy, injury related issues and orthopaedic disorders, the management of whom can become challenging as the safety of the growing baby becomes pertinent while managing such conditions. This article on “ClinicO-scOPe” highlights the common orthopaedic issues like Low Back Pain (LBP), Pelvic Girdle Pain (PGP), Hip pain, Carpal tunnel syndrome, Plantar fasciitis, Mom’s thumb, Calf swelling and cramps, Meralgia paraesthetica, Osteitis pubis, Knee pain and Arthritis in pregnancy, Slipped discs, including Transient hip osteoporosis and Avascular necrosis of hip; knowledge & awareness of which in our opinion should be there amongst all obstetricians and general practitioners. This know how can go a long way in avoiding much of the morbidity in pregnant ladies especially with regard to awareness about little interventions, life style modifications & guidance in most of these conditions.

**Keywords: Pregnancy; Orthopaedic problems; Musculoskeletal problems**

## Introduction

Managing orthopedic conditions in pregnant female is challenging and needs to be carefully thought of so that the security of both mother and the growing baby is ensured. Good news is that the management of orthopedical conditions is largely conservative and so concerns related to safety usually are guarded. Pregnancy as such doesn't essentially effect treatment of pathologies requiring operative intervention. If surgery is taken into account, anesthesia chosen should ensure minimal overall drug exposure to the growing baby and continuously monitoring foetal vital signs of distress. Peripartum & intraoperative radiography can be undertaken if required with 360° foetal shielding. Lateral positioning during surgery is good to forestall cardiovascular compromise related to compression of the inferior vena caval system.

This text describes pregnancy-related orthopedic issues and conditions giving emphasis on the pathologic process, signs, symptoms, physical examination findings, diagnostic work-up, and interventions. Pregnancy as such burdens the musculoskeletal system. Expectant mothers typically would need care of both of an orthopedist and Obstetrician. The enlarging baby in the womb with associated increase in weight alters the maternal body's center of gravity especially stressing the axial and girdle systems. To this is added, the stresses imposed by prolactin hormone level fluctuations and fluid retention.

## Low back pain [1]

Low back pain occurs in 60-70% of pregnancies especially so in the later period of pregnancy. It may radiate to the posterolateral thigh, knee and calf, however not to the foot, which is usually seen in radiculopathy due to disc prolapse. It is found that seldom one in three ladies seeks for skilled care. It is usually described as Low Back Pain (LBP), Peripartum Posterior girdle Pain (PPPP), Pregnancy-related Low Back Pain (PLBP) or Pregnancy-Related Girdle Pain (PRGP). The last two patterns may occur separately or in combination. The reasons outlined for its occurrence being mechanical derangement, hormonal, circulatory and psychosocial factors leading to particular

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vulnerability in certain group of females.

Most of the new weight is added by the developing fetus in utero & is largely unbalanced. Consequently, spine undergoes compensatory changes in alignment to keep the body balanced and straight resulting in early muscle fatigue and even muscle spasms. Muscles of the lower back are stressed more than usual to support additional weight. The abdominal muscles get stretched to accommodate the increasing womb. As they stretch, these muscles get tired and lose strength in maintaining normal body posture, adding on the stresses on the spine further.

Multiple pregnancies, increasing maternal age, physical and psychological work related & personality associated factors enhances likelihood of LBP. Though treating LBP is often challenging during the pregnancy, it seldom lingers on post delivery. Continued post delivery LBP may be due to abnormality in posture, which can be attributed to avoiding pain from episiotomy site or wound following abdominal delivery like prolonged forward bending to relieve any tension off of any incisional wounds. Even when the body has cured post delivery, vast life changes like sleep deprivation, feeling excessively exhausted, and sitting in one position throughout long feeding sessions like staying bent forward for long periods of your time can contribute. If there's a previous history of LBP, pectoral pain, or cervical spine pain, this abnormally bent position can cause a relapse or aggravation of pre existing dysfunction. After the baby arrives, last thing in the mind of the mother is keeping herself in sensible posture which often is just the only thing required to avoid pain due to such stresses on the spine. So, it is intelligent to be aware of maintaining sensible mechanics-while doing such activities like dressing, changing, lifting and feeding the baby. Simple things like use pillows to support during breastfeeding or feeding, and ensuring comfortable sitting & avoiding too much forward bending are some simple measures to keep this problem in check. Set of abdominal strengthening exercises may help to provide better spinal support. A physiotherapist guided physical pre and post natal care helps to keep musculoskeletal system healthy during this period. It targets reviving the alterations in biomechanics. Another intervention that's becoming popular is acupuncture. A continuous use of acupuncture for a week at specific pressure points will decrease pain and increased physical activity, diminishing medicine requirements. Good use of ergonomics which teaches girls to correct posture i.e., helping pregnant girls to learn the way to square, walk, or bend properly, while not inflicting additional stress on the spine. Braces that ensure correct body posture also are offered if the directions don't seem to be enough to take care of the problem. Promoting activity modification including scheduled rest periods is useful for relieving muscle spasms and acute pain. Role of TENS though not proven has been tried as a supplementary medical care. Regular Yoga effectively decreases low back pain intensity. Aerobic Exercises like walking, swimming, Tai chi, recumbent bicycle (or n-step) have been used with variable outcomes. LBP imparts a strong negative impact on the regular routine of a pregnant lady. Becoming ready before and throughout this physiological state by adopting a correct diet and performing abdominal and back strengthening exercises can help to avert this problem to a good extent especially during later half of pregnancy.

### **Carpal tunnel syndrome [2]**

The median nerve travels in a tunnel across the wrist on its way to hand from front of forearm under flexor retinaculum referred to as the carpal tunnel. Carpal tunnel syndrome is a condition during which

the median nerve gets pinched within the carpal tunnel effecting its blood supply too. Typically, folks with carpal tunnel syndrome can complain of pain, tingling, and symptom within the hand and fingers. Carpal tunnel syndrome is attributed in pregnancy to retention of fluids, particularly in the third trimester. It is treated with night splints, ice compresses and ketosteroid injections if required. The treatment helps in reducing pain and limits carpus movement. The condition usually improves with the delivery of the baby.

### **Plantar fasciitis [3]**

It is the inflammation of a thick band of tissue, referred to as the plantar fascia, that connects the heel bone (calcaneum) to the toes and assist in supporting the arch of the foot. It causes stabbing pain in the heel and is often related to speedy weight gain during pregnancy. It typically worsens in the morning. It is treated with ice application, orthopaedic silicone rubber shoe inserts, night splints, and regular foot massage. Local ketosteroid injections are given if the pain is severe.

During pregnancy, feet dimensions increases, due to fluid accumulating within the tissues of lower extremities. Hormonal changes result in ligamentous laxity and increased mobility thus inducing abnormal stresses on the joints. This loosening leads to rise in foot length and dimension with a decrease in arch height & thus increasing foot pressure further especially in the region of heel. Shoes could feel tighter or even the size can change. It has been found to be most noticeable in the first pregnancy and incidence tends to be less with subsequent pregnancies. Importantly, these changes tend to reverse after delivery. But some girls could notice permanent changes in the form of their feet or even shoe wear limitations. Laxity or looseness of foot and talocrural joints might cause instability. Weight gain will further worsen the instability. These changes, may translate into gait abnormalities (wide based gait) with the progression of pregnancy. Some foot conditions resulting from joint laxity like bunions and flat feet, could progress further and stay symptomatic even after pregnancy terminates.

### **Calf swelling, cramping [4]**

Venous blood flow from the legs back to the central venous pool gets slowed due to the pressure on the inferior caval system by the increasing size of the gravid uterus, resulting up in swelling within the legs. Certain activities help in checking swelling and discomfort like wearing compression stockings, regular walking and low impact aerobics, good hydration, frequent stretching of the calves and massaging the swollen legs.

### **Meralgia paresthetica [5]**

It is a comparatively uncommon condition and usually seen in overweight ladies. The condition is caused by the compression of the lateral cutaneous nerve of thigh as it passes under the inguinal ligament on its way to thigh from abdomen & it provides sensation to the upper anterolateral aspect of thigh. When the baby increases in size, the pressure against the nerve will produce a notable patch of symptom on the anterolateral aspect of thigh like tingling, burning sensations or hypoaesthesia. In severe cases, ketosteroid injections round the nerve will give relief. It has been found that this paresthesia typically resolves on its own after the delivery.

### **Osteitis pubis [6]**

It is a inflammatory condition affecting the bones at the front of the pelvis referred to as the os symphysis. Pubic symphysis gets stressed during pregnancy largely due to the added weight and

stresses imposed by the position of the developing baby. Use of ice or heat application, Non Steroidal Anti-Inflammatory Drugs (NSAIDs), or rest with advice of just being off the feet will considerably help in scaling back the groin pain and inflammation.

### Transient osteoporosis of hip [7]

This is very uncommon disorder seen in small group of pregnant ladies and its diagnosis is important so as to decide on the proper treatment and avoid complications like fractures, before or during period of child bearing. There is temporary bone loss that considerably weakens the ball-and-socket joint. The cause is not clear, however hormones, weight-bearing stress, and obstruction of tiny blood vessels round the hip are thought of as contributing factors. The condition is characterised by the sharp onset of pain, generally within the front of the thigh & the groin or the buttocks. Although rare, hip fractures may occur spontaneously or with trauma, particularly during delivery. Cesarean Section has been tried to reduce the occurrence of this complication. Treatment involves use of crutches or a walker. NSAIDs to relieve pain while good nutrition and prescription of adjuvants like Vitamin D and bisphosphonates are shown to decrease complaints and also accelerate the healing of fracture. Complete resolution may take upto two years after delivery. Normally, any bone mass lost during pregnancy usually gets restored within few months. If a lady breastfeeds, then this bone mass restoration may take longer in absence of good nutrition, calcium or vitamin D supplementation. Estrogen is bone protective and its increased availability during pregnancy helps in increasing the intestinal absorption of calcium.

The National Academy of Sciences recommends ladies who are pregnant or breast feeding should consume 1,000 mg of calcium daily. Pregnant teenagers require 1,300 mg of calcium daily, otherwise she may become prone to develop osteoporosis early in life. Calcium rich sources include low-fat dairy farm products like milk, yoghurt and cheese, dark green, leafy vegetables like broccoli, collard greens and bok choy and fish like Tofu, Canned sardines and salmon. Almonds & foods fortified with calcium like orange juice, cereals and breads often contain calcium.

### Knee pain [8]

The development of knee pain is extremely common among pregnant ladies that could be due to natural impact of carrying around excess weight. They need to be counselled to take adequate rest and avoid undue straining especially during later months of pregnancy.

### Slipped disc [9]

The spine consists of alternating segments of vertebrae and discs. Discs acts as natural cushions between the vertebrae absorbing stresses and facilitating spinal movement. However, these protecting discs endure large pressures imposed by pregnancy with enhanced compression forces. Discs may slip out & get prolapsed, pressing against the spinal nerve roots, inflicting pain in the back radiating down towards the foot with neurological symptoms. Slipped or Prolapsed disc is the most common spine injury seen in pregnant ladies. Conservative treatment gives satisfactory outcome for management of symptoms in majority of these patients.

### Arthritis [10]

The physical changes during pregnancy effect joints and muscles in the following ways:

1. Joints can become loose and unstable leading to a "waddling gait" during pregnancy.

2. Knee problem increases further due to enhanced weight and weakening muscles, thus increasing knee pain especially going up or down stairs or on knee straightening.

3. Growing gravid uterus causes spine to curve with added strain on supporting erector spinae musculature. This may cause muscle spasms, LBP and tingling in the legs.

4. Increased blood flow during pregnancy puts additional load on the heart. There are chances of exaggeration of pre-existing heart problems like pericarditis or myocarditis.

5. Water retention could increase stiffness particularly in weight-bearing joints (hips, knees, ankles and feet).

6. Breathing: Diaphragm moves up due to the growing baby & leads to shortness of breath and can exaggerate pre-existing problems of respiratory system.

Good control of Arthritis is imperative before and during the pregnancy and can be obtained by-

**Arthritis medication:** Although it would be ideal to be off all medicines throughout pregnancy, usually this is not possible in reality and have the potential to effect the growing fetus.

**Exercise:** Helps to keep the muscles strong and maintaining joints mobility. They include both the range-of-motion exercises & muscle strengthening exercises.

**Walking or swimming:** Aerobic activities help to keep the muscles strong and increase endurance and are usually safe for pregnant ladies.

**Diet:** Good nutrition has to be ensured with adequate calcium intake and remember that arthritis may cause eating problems due to reduced amount of saliva (as in Sjogren's syndrome), associated tooth problems, mouth sores including trouble opening mouth with jaw pain due to temporomandibular arthritis as may be seen in various forms of spondyloarthropathies especially Rheumatoid arthritis, which is commonly occurs in young ladies of reproductive age.

**Joint protection:** Besides undertaking usual physiotherapy and conservative measures, joints of hands and knees can be protected with splints.

Rest helps to relieve pain in weight bearing joints such as your hips, knees, ankles and feet. Such patients should be encouraged to wear comfortable shoes (such as jogging shoes) that give good support. They are advised shoes with 1" to 1 1/4" heel, good arch support, roomy toe box and firm heel-counter. Lace-up or velcro-closure shoes provide the best support. Sleeping on a firm supportive mattress is promoted to reduce muscle spasms.

Also, stress management is beneficial to help ease the emotional ups and downs of pregnancy.

### Hip pain [11]

Hip pain is commonly found during pregnancy. The pain is mostly placed over the anterior or posterior aspect of the hip, and it worsens on weight bearing. In the first trimester as the fetus is small in dimensions and weight, so there is usually no pain as expected from pressure. In the second trimester as the baby grows, early mechanical complaints begin to emerge usually they are neurological in nature with pressure increasing on spine leading to sciatica type pain. In the third trimester, mechanical complaints either begin, keep constant

or worsen. Near delivery, hormone linked ligament laxity ensues to facilitate birth. This laxity may increase the pain intensity during this period, but it tends to become better after delivery.

Also, remember, the condition of transient osteoporosis while dealing the problem of hip pain during the pregnancy especially in the second or third trimester. A MRI is required to diagnose the condition. The condition usually resolves itself in six weeks, however one should be aware of occurrence of fracture of the hip in this disorder. Adequate rest and use of crutches to limit weight bearing on the affected hip helps to bring relief. Medicines like acetaminophen are safe to use, and localized corticosteroid injections could also be used in severe cases.

### Sacroiliac and pelvic girdle pain [12]

Pelvic girdle transfers body weight and ground reaction force throughout activities of daily living. This function becomes more vital during pregnancy as weight will increase upto even ten kilos by forty weeks of pregnancy. It requires good pelvic balancing for proper performance. Even sacroiliac joint dislocation during pregnancy have been reported. The pelvis tilts forward as maternity progresses. Besides, prolactin, which increases upto ten times by term leads to laxity of sacroiliac ligaments and other pelvic ligaments including symphysis pubis increasing the chances of distortion of alignment. Additionally, relatively small & flat pelvic bones of the females, makes them prone for instability during pregnancy. A differing degree of girdle anteversion on the right or left side is found during the pregnancy. These changes result in straining the pelvic girdle supporting structures and thus causing pregnancy-related sacroiliac joint pain. Moreover, failure to transfer load from lumbopelvic region because of pelvic girdle malalignment can cause low back pain. Alterations in pelvic floor anatomy which gets accentuated during child birth may also cause urinary or fecal incontinence. So, it is pertinent to note that these musculoskeletal changes can greatly affect the quality of life of a woman.

### DeQuervain's synovitis [13,14]

It is also called as "mother's thumb", is the stenosing tenosynovitis affecting abductor pollicis longus & extensor pollicis muscle tendons tendon in the first compartment under dorsal carpal ligament as they travel across the wrist. It is especially seen during second and third trimesters. Prolactin secretion that starts increasing from eighth week of gestation and reaches to upto ten times at term has been linked to the occurrence of this disorder in absence of other causative factors during pregnancy. Prolactin induces ligament laxity causing them to weaken and making them prone to strain on stresses. In fact, some authors suggest drawing prolactin blood samples in patients of this disorder. Occurrence of this condition in both non-dominant and dominant hands also favours hormonal theory. The other contributing reason is accumulation of fluid within the tunnel affecting the excursion of these tendons & hence inflicting pain. The problem gets compounded after delivery, when the strain on tendons increases further by holding the baby especially during breast feeding. Prolonged wrist posture in ulnar deviation, wrist flexion and thumb extension during breast feeding stresses abductor pollicis longus & extensor pollicis tendons. Lady experiences pain in the region of thumb which may extend upto wrist & forearm. Activities like pinching, pulling, twisting or reaching the thumb across the palm toward the little finger can be painful and restricted. Conservative treatment like splinting to give rest in the area along with oral acetaminophen is helpful. Once breastfeeding is interrupted, symptoms typically resolve. So, even imparting

education on proper position for holding the baby especially while giving breast feeding is very helpful.

### Aseptic necrosis of the femoral head [15]

Aseptic necrosis of femoral head and transient osteoporosis are the two comparatively rare conditions seen during pregnancy and can present with pain in the hip region. Early identification and treatment is the key for a good outcome and to check the occurrence of fractures in these ladies especially who are elderly primigravida during child birth. This is important as they may be missed due to higher incidence of commonly occurring pelvic pain as a result of altered biomechanics of pregnancy and relaxation effect of increased prolactin secretion on the supporting lumbopelvic ligaments. Symptom especially pain deep in the groin due to avascular osteonecrosis of femoral head typically begin in the later part of pregnancy and may get aggravated during and after delivery. Pain might radiate to the knee, thigh or back. The exact aetiology is not known, although it's postulated that the increase in unbound adrenal corticosteroid, estrogen and progesterone hormones in late gestation, increased intraosseous pressure and vascular compromise in femoral circulation induced by the compression of the gravid uterus injury due to difficult delivery may all contribute. Plain radiographs revealing arc-like subchondral radiolucent areas, increased bone density and osteolysis in femoral head with collapse in advanced stages may be seen. However MRI is the modality of choice to diagnose this condition in early stage and thus managing it early and adequately to avoid complications. Management focuses on rest and avoiding weight-bearing on the affected limb. Complications in the form of collapse of femoral head and secondary hip osteoarthritis might develop in advanced stages and may need surgical management at a later age.

### Conclusion

This article on "ClinO-sCOPE" which emphasizes on common orthopaedic problems related to pregnancy gives a bird's eye view with regard to key issues including giving an insight into the problem, its diagnosis and management. It will help the clinicians to look into these problems as presented to them without missing and dealing with them effectively.

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