

Ultrasound-Guided Caudal Epidural block

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ABSTRACT

Caudal epidural anesthesia has many applications, including surgical anesthesia in children and adults, as well as the management of acute and chronic pain conditions. Caudal anesthesia was described at the turn of last century, however, did not gain in popularity immediately because of the wide anatomical variations of sacral bones and the consequent failure rate associated with attempts to locate the sacral hiatus. With the advent of imaging technology, fluoroscopy and ultrasonography have been increasingly used to guide caudal epidural block.

The ultrasound-guided caudal block was first described in 2003 and has, since then, gained increasing popularity. Several studies from various ethnic populations have repeatedly reported very high successful rates (96.9–100%) for this procedure.

Ultrasound guided Ilioinguinal and Genitofemoral Nerve block

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ABSTRACT

Ilioinguinal and Genitofemoral nerve blocks are useful in the evaluation and management of groin pain thought to be mediated by these nerves, including the pain associated with ilioinguinal and genitofemoral neuralgia.

The ilioinguinal nerve is a branch of the L1 nerve root with a contribution from T12 in some patients and the genitofemoral nerve arises from fibers of the L1 and L2 nerve roots.

The ilioinguinal nerve provides sensory innervation to the upper portion of the skin of the inner thigh and the root of the penis and upper scrotum in men or the mons pubis and lateral labia in women.

The genitofemoral nerve divides into a genital and femoral branch just above the inguinal ligament. In males, the genital branch travels through the inguinal canal, passing inside the deep inguinal ring to innervate the cremaster muscle and skin of the scrotum. In females, the genital branch follows the course of the round ligament and provides innervation to the ipsilateral mons pubis and labia majora. In males and females, the femoral branch descends lateral to the external iliac artery to pass behind the inguinal ligament. The nerve enters the femoral sheath lateral to the femoral artery to innervate the skin of the anterior superior femoral triangle.

The ilioinguinal nerve block provides intraoperative and postoperative analgesia for inguinal surgery like inguinal hernia repair, orchidopexy, hydrocoele repair and varicocoele surgery.

These blocks can be done by using landmark or ultrasound guided techniques. Recent studies shows the ultrasound-guided nerve block enables accurate needle positioning that may reduce the chances of drug toxicity, drug dose and block failure.

Ultrasound guided pes anserine injection

ABSTRACT

Pes anserine bursitis is a common cause of medial knee pain and present with point tenderness over the medial knee just below the medial knee joint. For ultrasound guided pes anserine bursa injection ,after informed consent, in Supine position with the knee slightly flexed with a high-frequency linear ultrasound transducer is placed over the medial knee joint space in the oblique longitudinal plane with the superior portion of the ultrasound transducer turned about 20 degrees toward the patell, The pes anserine bursa lies just beneath the pes anserine tendon at this level. When the pes anserine tendon and pes anserine bursa are identified, a 22-gauge needle is placed through the skin 1 cm above the middle of the superior aspect of the longitudinally placed transducer and is then advanced using an out-of-plane approach with the needle trajectory adjusted under real-time ultrasound guidance until the needle tip passes through the pes anserine tendon and lies in between the tendon and the tibia and is injected 4.0 mL of 0.25% preservative-free bupivacaine and 40 mg of methylprednisolone using strict aseptic technique. Major complication of this procedure is Infection.

Key point: pes anserine bursa,ultrasound,injection

Ultrasound-guided Costotransverse and Costochondral Injection in Thoracic Back Pain Patients

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ABSTRACT

Although the CTRV joints are relatively less studied compared to the thoracic facet joints and intervertebral disks, it has been well established that the CTRV joints may produce clinically significant thoracic back pain. For image optimization, we identified the transverse process, CTRV joint, rib, and lung in the same plane. With an in-plane approach, the needle was advanced medially toward the CTRV joint. As the needle passed under the transverse process of the target CTRV joint, it was advanced until the tip penetrated the capsule. Ultrasound-guided CTRV joint injections reduced patients' pain scores and led to a high level of satisfaction.

Costochondritis is an inflammatory process of the costochondral or costosternal joints that causes localized pain and tenderness. Any of the 7 costochondral junctions may be affected, and more than 1 site is affected in 90% of cases. The second to fifth costochondral junctions most commonly are involved. Diagnostic ultrasound may serve a role in identifying effusions, synovitis, increased perfusion, and costal cartilage that is "increased in size compared to the contralateral one" and "appears more echogenic with dot-like hyper-reflective echoes and intense broad posterior acoustic shadowing." In addition to aiding the diagnosis of costochondritis, ultrasound may prove to be a useful therapeutic adjunct to targeted injections. Although most cases of costochondritis will resolve with conservative management, refractory cases may require intra articular steroid injection.

Key words: Costotransverse joints, Costochondral block, Ultrasound Guided block

Spinal sonoanatomy and US guided spinal injections in Thoracic Back Pain Patients

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ABSTRACT

Back pain and radiculopathy are very common conditions - in reality most people will experience neck or potentially low back pain at any rate once in their life, and with expanding age a more noteworthy number of patients with such indications are seen by doctors. Beside active recuperation and other rehabilitative techniques, injection treatment focused to the spinal joints or to the nerve roots is settled in the treatment of lumbar radiculopathy. Be that as it may, this has been performed without picture direction for some a long time, but in the last decade ultrasound showed a reasonable guidance for performing this injections. These days minimally invasive treatments, such as imaging guided methods have entered the tool kit of the pain doctor and on account of their usability and better achievement rates are turning into a vital piece of multidisciplinary pain management approach. Ultrasound (US) has demonstrated in any event adequately dependable and precise in the exhibition of spinal canal and paravertebral life systems. The feasibility of US-guided injection therapy at the spine has also been demonstrated in several studies. In this study we try to have a look on how to do US guided lumbar spine exam and performing spinal injections.

BASICS OF ULTRASOUND IMAGING FOR NERVE BLOCKS

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ABSTRACT

The advantages of ultrasound in pain medicine and nerve block are: Reveals the nerve location, provides real-time image, images the local anesthetic spread, improves the quality of block, the onset time, success rate compared to nerve stimulator techniques, reduces the number of needle attempts, differentiates extravascular from unintentional intravascular injection and extraneural from unintentional intraneural injection.

The frequency of an ultrasound wave is above 20,000 Hz (or 20 KHz) and medical ultrasound commonly is in the 2.5-15 MHz range. Human hearing is in the 20-20,000 Hz range.

An ultrasound wave is generated when an electric field is applied to an array of piezoelectric crystals located on the transducer surface. Electrical stimulation causes mechanical distortion of the crystals resulting in vibration and production of sound waves (i.e. mechanical energy). The conversion of electrical to mechanical (sound) energy is called the converse piezoelectric effect. An ultrasound image is generated when the pulse wave emitted from the transducer is transmitted into the body, reflected off the tissue interface and returned to the transducer. For applying U/S in pain medicine and nerve block the physicians must know the basic of its mechanism.

Ultrasound-Guided LUMBAR PLEXUS (Psoas Compartment) Block

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ABSTRACT

The lumbar plexus is formed by the anterior divisions of L1, L2, L3 and the greater part of L4. The L1 root often receives a branch from T1.

Branches of the lumbar plexus include:

- Femoral nerve
- Lateral femoral cutaneous nerve
- Obturator nerve
- Ilioinguinal, iliohypogastric, and genitofemoral nerves

Indications:

Psoas compartment block is often used to provide postoperative analgesia for patients undergoing major knee and hip surgery.

Contraindications:

Significant coagulopathy

Significant lumbar spine deformity

- Ultrasound-Guided Technique:
- Place the patient in the lateral decubitus position with the side to be blocked uppermost.
- Scan the paravertebral region at L2-3 cephalad to the iliac crest.
- After skin and transducer preparation, place a curved transducer with the appropriate frequency range (2-5 MHz) longitudinally adjacent to the spine (midline) to capture a longitudinal view of the transverse processes.
- Then Turn the transducer transverse to obtain a transverse view of the psoas muscle.
- The adult lumbar plexus lies deep within the psoas major muscle. It is usually not visualized under ultrasound but is expected to lie within the posterior 1/3 of the muscle bulk. Note the skin to peritoneum distance.
- Insert a 12-15 cm 22 G insulated needle in plane (needle advancement may be safer in the medial to lateral direction) with the transducer perpendicular to the skin .
- Once satisfied with needle placement, inject 20-30 mL of local anesthetic for surgical anesthesia or postoperative analgesia.
- Observe fluid and tissue expansion within the psoas muscle bulk.
- Unintentional kidney (K) puncture and hematoma has been reported following psoas compartment block when the needle is inserted above L1-2 and too lateral.

Ultrasound guided piriformis and quadratus lumborum (QL) muscle block

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Pain fellowship

ABSTRACT

Piriformis injections are commonly performed in pain clinics to diagnose and pain relief of patients suffering buttock and leg pain. Piriformis muscle is small, deep located, and related to important adjacent neurovascular structures such as sciatic nerve, thus physicians traditionally inject in this muscle by EMG or imaging guidance like fluoroscopic, CT and MRI. We want to discuss about ultrasound-guided piriformis and quadratus lumborum (QL) muscle injections. Ultrasound has several advantages over traditional imaging approaches, including mobility, availability, small size, lack of ionizing radiation exposure, and direct visualization of neurovascular structures. Pain physicians with adequate training and experiences can perform ultrasound-guided piriformis or QL injections into their clinic or office.

Ultrasound guided piriformis and quadratus lumborum (QL) muscle block

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ABSTRACT

Each of the cervical vertebrae has a unique feature.

So that the anatomy of each cervical spine each is different from the other one.

Therefore, for access to the nerve of the medial branch of each level, especially with the use of ultrasound , a detailed understanding of the pathway of the nerves to each vertebra, its adjacent blood vessels, as well as neck sonoanatomy is required.

In this lecture, I try to explain the important points of the anatomy of the cervical spine and pathway of median branches of dorsal rami in long and short axis ultrasound study.

Ultrasound guided trigger finger and MCP injection

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ABSTRACT

Trigger finger is a common cause of hand pain and functional disability. The most common cause is tenosynovitis of the flexor digitorum superficialis tendon especially at A1 pulley. If treatments with drugs and physical therapy fail, injection of trigger finger is a reasonable next step. For more precision of injection, ultrasound is used. A high-frequency linear transducer is placed in a transverse position just proximal to the metacarpophalangeal joint. When the A1 pulley is identified, the patient is asked to flex and extend the finger under real time imaging. The tendons are observed for tendinosis, defect, swelling, nodules and triggering as well as to identify the pathology. finally injection will be performed under ultrasound guidance.

Ultrasound guided knee joint injection

Dr. kamran mahmoudi

ABSTRACT

The knee joint is susceptible to the development of arthritis from a variety of conditions that all have the ability to damage the joint cartilage. Traditionally, intra-articular injections have been performed using anatomical landmark to identify the correct trajectory for needle placement. Incorrect needle placement has been partially attributed to variable clinical outcomes and complications. Various imaging modalities can be used to improve the accuracy of intra-articular injections, including fluoroscopy, computed tomography, and magnetic resonance imaging. Ultrasound is one of the most practical because it is rapid, safe, relatively inexpensive, emits no ionizing radiation, and can be performed in the outpatient clinical setting. Although several approaches can be used to establish an intra-articular injection of the knee joint, the accuracy differ per approach. The superolateral approach was investigated most and resulted in the highest pooled accuracy rate.

Ultrasound- Guided ankle joint Injection

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ABSTRACT

Both chronic as well as acute foot and ankle pain are common indications for visits to pain specialists, general practitioners, rheumatologists and orthopedic surgeons. The causes for foot and ankle pain are varied and can include osseous pathology (fractures), yet the far greater majority are secondary to soft-tissue injuries and inflammation. Regional corticosteroid injections, traditionally performed using anatomic landmarks, can be inaccurate and miss intended targets.

When imaging guidance is used, the procedure can be done safely and successfully, avoiding nerves, vessels, tendons, and other structures. With US guidance, the physician can visualize the needle tip continually and assure that the needle is placed precisely in the desired location. US has several additional advantages over CT or fluoroscopic-guided procedures. US is relatively inexpensive and widely available. It is portable and can be done at the bedside, in the ICU, emergency department or an office setting. The use of ultrasound for guidance for interventional radiologic procedures is well known, including guidance for vascular as well as visceral interventions. Using sonography to guide for interventions in the musculoskeletal system, specifically the foot and ankle, yields accurate placement of the needle tip and subsequent anesthetic/steroid injection as well as diagnostic aspiration of tendon sheaths, joint spaces, nerve and bursae.

Ultrasound guided ischial bursitis injection

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ABSTRACT

Pain in the gluteal region may be due to a number of causes including “Ischial bursitis “ that is one of common causes of posterior hip and buttocks pain. Ischial bursitis has also been described as the ischiogluteal bursa or weaver’s bottom. Inflammation of this bursa is mainly due to chronic and continuous irritation and occurs most often in individuals who have a sedentary occupation. On a careful physical examination, ischial bursitis appears as a painful and swollen area over the ischial tuberosity .Sonography (US) is valuable in the evaluation of superficially located soft tissue lesions .If the pain doesn,t improve with rest, changes in activities of daily living, and non-steroidal anti-inflammatory drugs and physical therapy, sonographic guided Ischial bursa injections are technically feasible and effective approach for pain relief.

Ultrasound(US) guided Greater trochanter injection

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ABSTRACT

Greater trochanter pain syndrome (GTPS) is referred to localized lateral pain and tenderness over the greater trochanter.

Some conditions are common causes of GTPS such as:

Greater trochanter bursitis, gluteus medius or minimus tendinitis / tear or both , abnormalities of iliotibial band.

Conservative therapies include: NSAIDs, physiotherapy, ice, shockwave therapy, activity modification, weight loss. But it is self limited for the majority.

When these methods fail to provide pain relief , trochanteric bursa injection of corticosteroid and local anesthetic can be indicated and effective.

For the correct injection and to see better its treatment effect, usually injection has been done under fluoroscopic guidance.US guidance recently described as an alternative method for fluoroscopic method.

Ultrasound (US) guided Greater trochanter injection method: Patients lay at lateral position with the symptomatic hip facing upward and hip and knee gently flexed.

Linear probe (6-12 MHZ) is positioned in short axis view perpendicular to long axis of femur at level of GT. Then injection is performed from posteriolateral approach in plane.

Ultrasound guidance for airway management

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ABSTRACT

Ultrasonography has been increasingly used in airway management. Identification of cricothyroid membrane for the front of neck access before induction of anesthesia is probably the most popular indication.¹ Assessment of postoperative vocal fold movement when nerve injury is suspected is another interesting application of ultrasonography.² This modality can be used to confirm ventilation by observing lung sliding bilaterally, verify endotracheal intubation, detect intraoperative pneumothorax, and aid in percutaneous dilatational tracheostomy.^{3,4}

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Ultrasound-Guided Lateral Femoral Cutaneous Nerve Block

ABSTRACT

Ultrasound-guided lateral femoral cutaneous nerve block is utilized as a diagnostic and therapeutic maneuver in the evaluation and treatment of pain thought to be mediated via the lateral femoral cutaneous nerve. The most common pain syndrome mediated via the lateral femoral cutaneous nerve is the entrapment neuropathy meralgia paresthetica. The lateral femoral cutaneous nerve is one of the nerves derived from the lumbar plexus and is comprised of nerve fibers from posterior divisions of the L2 and L3 nerves. Ultrasound-guided lateral femoral cutaneous nerve block can be carried out by placing the patient in the supine position . A total of 5 mL of local anesthetic and 40 to 80 mg of depot steroid is prepared. A linear high-frequency ultrasound transducer is placed in a plane perpendicular with the inguinal ligament. The ultrasound transducer is then slowly moved in an inferomedial direction along the course of the inguinal ligament until the hyperechoic honeycombed-appearing lateral femoral cutaneous nerve appears lying beneath the fascia lata and on top of the sartorius muscle. A 3½-inch, 22-gauge needle is advanced from the middle of the inferior aspect of the ultrasound transducer and advanced in a cranial trajectory utilizing an out-of-plane approach.

Ultrasound guided SIJ injection

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ABSTRACT

SIJ dysfunction is pain originating in the sacroiliac joint without fixed anatomic lesions and is it guessed to be due to a biochemical abnormality

Predisposing factors include conditions causing stress on the joint such as spinal deformity, previous spinal surgery, and leg length discrepancy

Symptoms include pain in the superior medial quadrant of the buttock, the lateral buttock, and inferior to the posterosuperior iliac spine, with radiation to the greater trochanter, upper lateral thigh, and groin

there are 3 approach for SIJ injections : Blind technique, Fluoroscopic guidance and ultrasound guided injections, in this article we getting to know more about ultrasound approach

Ultrasound Guided Stellate Ganglion Block

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ABSTRACT

The cervical sympathetic ganglia consist of the superior, middle, and inferior ganglia. The stellate ganglion, which is also known as the inferior cervical ganglion, is located on the anterior surface of the longus colli muscle. This muscle lies just anterior to the transverse processes of the C7 & T1 vertebrae.

The stellate ganglion is made up of the fused portion of the C7 & T1 & T2 sympathetic ganglia. The stellate ganglion lies anteromedial to the vertebral artery and is medial to the common carotid artery and jugular vein. The stellate ganglion is lateral to the trachea and esophagus.

Ultrasound-guided stellate ganglion block was first introduced in 1995 with promising results. The main advantages of ultrasound over the traditional technique are direct visualization of the stellate ganglion and adjacent structures and visualization of the spread of the local anesthetic.

Title: Ultrasound-Guided Paravertebral Nerve Block

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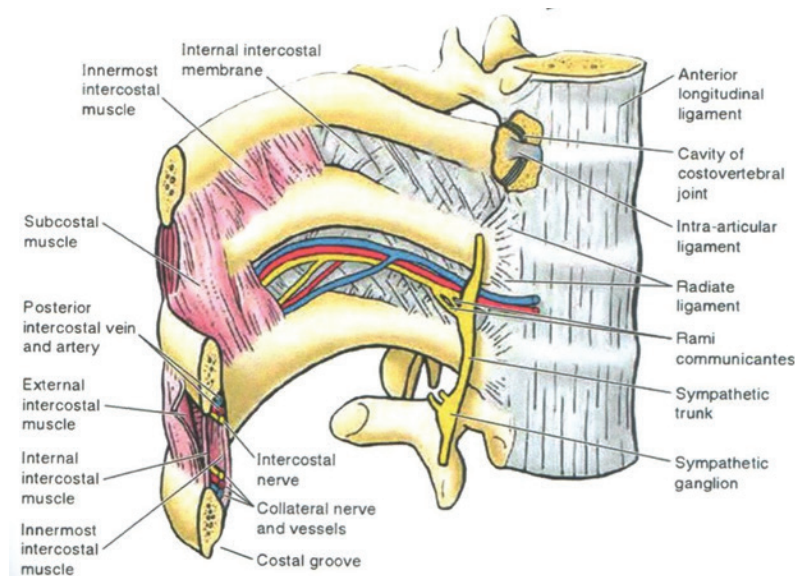
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ABSTRACT

Background: CLINICAL RELEVANT ANATOMY

Exiting their respective intervertebral foramen and passing just below the transverse process are the paravertebral nerves. After off a recurrent branch that loops back through the foramen to provide innervation to the spinal ligaments, meninges, and its respective vertebra and can be an important contributor to spinal pain. The paravertebral nerve also provides fibers to the sympathetic nervous system and the thoracic sympathetic chain via the myelinated preganglionic fibers of the white rami communicantes as well as the unmyelinated postganglionic fibers of the gray rami communicantes. The intercostal nerve then divides into a posterior and an anterior primary division. The posterior division courses posteriorly and, along with its branches, provides innervation to the facet joints and the muscle and skin of the back. The larger, anterior division courses laterally to pass into the subcostal groove beneath the rib along with the intercostal vein and artery to become the respective intercostal nerves. The 12th thoracic nerve courses beneath the 12th rib and is called the subcostal nerve and is unique in that it gives off a branch to the first lumbar nerve, thus contributing to the lumbar plexus. The intercostal and subcostal nerve provide the innervation to the skin, muscles, ribs, and the parietal pleura and parietal peritoneum.



Ultrasound guided Tennis elbow and CTS injection

ABSTRACT

Tennis elbow specifically involves the lateral epicondyle, where the extensors muscle and tendon attached it, and don't have to play tennis to get this. Approximately 90-95% of patients with tennis elbow respond to conservative therapy (e.g. corticosteroid injection, splinting and acupuncture therapy).

Carpal tunnel syndrome (CTS) is a medical condition due to compression of median nerve as travel through carpal tunnel and if diagnosed and treated early. the symptom can often relieve without surgery. although surgery is usually applied for patients with progressive and persistent sign and symptom especially the thenar atrophy.