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CLINICAL INFORMATION

Ultrasound-guided facet block to low back pain: a case report

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KEYWORDS

Facet block;
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Abstract

Background: osteoarthritis is a common cause of low back pain. The diagnosis is clinical and can be confirmed by imaging studies. Pain treatment and confirmation of diagnosis are made by intra-articular injection of corticosteroid and by local anesthetic use, due to clinical improvement. A direct monitoring of the procedure can be done under fluoroscopy, a classic technique, or else by an ultrasound-guided procedure.

Case report: female patient, 88 years old, 1.68 m and 72 kg, with facet osteoarthritis at L2–L3, L3–L4 and L4–L5 for two years. On physical examination, she exhibited pain on lateralization and spinal extension. We opted in favor of an ultrasound-guided facet joint block. A midline spinal longitudinal scan was obtained, with identification of the desired joint space at L3–L4. A 25 G needle was inserted into the skin by the echographic off-plane ultrasound technique. 1 mL of contrast was administered, with confirmation by fluoroscopy. After aspiration of the contrast, 1 mL of solution containing 0.25% bupivacaine hydrochloride and 10 mg of methylprednisolone acetate was injected. Injections into L3–L4, L2–L3 and L1–L2 to the right were applied.

Conclusions: the visualization of the facet joint by ultrasound involves minimal risk, besides reduction of radiation. This option is suitable for a large part of the population. However, fluoroscopy and computed tomography remain as monitoring techniques indicated for patients with specific characteristics, such as obesity, severe degenerative diseases and anatomical malformations, in which the ultrasound technique is still in need of further study.

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PALAVRAS-CHAVE

Bloqueio facetário;
Lombalgia;
Ultrassom

Bloqueio facetário guiado por ultrassom para lombalgia: relato de caso

Resumo

Justificativa: A osteoartrose facetária é causa frequente de dor lombar. O diagnóstico é clínico e pode ser confirmado por imagem. O tratamento da dor e a confirmação do diagnóstico são feitos pela injeção intra-articular de corticosteroide e anestésico local, por causa da melhoria clínica. A monitoração direta do procedimento pode ser feita por fluoroscopia, técnica clássica, ou guiada por ultrassom.

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Relato de caso: Paciente do sexo feminino, 88 anos, 1,68 m e 72 kg, com osteoartrose facetária em L2–L3, L3–L4 e L4–L5 havia dois anos. No exame físico, dor à lateralização e à extensão da coluna. Optou-se pelo bloqueio da articulação facetária guiado por ultrassom. Foi feito escaneamento longitudinal na linha média da coluna vertebral e identificado o espaço articular desejado em L3–L4. Uma agulha 25 G foi introduzida na pele pela técnica fora de plano ecográfico. Foi administrado 1 mL de contraste, confirmado com fluoroscopia. Após aspiração do contraste, foi injetado 1 mL de solução contendo cloridrato de bupivacaína 0,25% e 10 mg de acetato de metilprednisolona. Foram feitas injeções nos espaços L3–L4, L2–L3 e L1–L2 à direita.

Conclusões: A visualização da articulação facetária pelo ultrassom determina mínimo risco e redução da radiação e é indicada para grande parte da população. Ainda assim a fluoroscopia e a tomografia computadorizada permanecem como monitoração indicada para pacientes com características específicas, como obesidade, doenças degenerativas intensas e malformações anatômicas, nas quais o ultrassom ainda necessita de mais estudos.

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Introduction

The ultrasonographic technique was introduced in regional anesthesia for visualization of paraspinal and neuraxial structures. This technique is also used to aid in the visualization of epidural space in obstetric anesthesia procedures in obese^{1,2} and difficult to puncture³ patients, as well as in peripheral nerve blocks.⁴ The use of ultrasound for treatment of pain is still in the development stage⁵ and the procedure may be useful for stellate^{6,7} and sacrococcygeal⁸ ganglion, obturator and femoral nerve,⁹ and cervical and lumbar facet joint blocks.^{10,11}

Case report

Woman, Caucasian, 88 years old, 1.68m and 72 kg, with a diagnosis of bilateral facet osteoarthritis at L2–L3, L3–L4 and L4–L5 for two years. In the initial interview, the patient was complaining of lower back pain radiating to the lateral and posterior regions of the right thigh, without improvement with the use of paracetamol, weak opioids and transcutaneous electrical stimulation. As precedent, the patient sustained a transtrochanteric fracture of the left femur with surgical correction without complications, and with a clinically stable osteoarthritis. On physical examination, the patient mentioned bilateral pain on lumbar spine lateralization, more marked on the right, and also with pain on extension. The pain was relieved during flexion of the lumbar spine. On compression, the vertebrae were painless; the intervertebral spaces were palpable. The patient was Lasegue- and Patrick-Faber-negative and with no alterations of tactile, thermal or painful sensation and of motor strength in her lower limbs. The laboratory workup revealed blood count, creatinine and electrolytes within normal limits, and her electrocardiogram showed left bundle branch block.

The patient was informed about the advantages and disadvantages of corticosteroid injection into the zigoapophysary joint. The procedure was performed in a surgical center on an outpatient basis, with fasting before the blockade.

The ultrasound study was performed with a SonoSite M-turbo[®] machine with a 3–9MHz curved transducer. Anti-sepsis of the skin was applied, with placement of sterile fields; the transducer was also covered with sterile field. The patient was placed in prone position with a pillow under the abdomen to decrease the lumbar lordosis. Sterile gel was applied on the skin where the reference points were marked. A longitudinal scan was initiated on the midline of the spine, starting at the sacrum. After the identification of the desired joint space at L3–L4, the transducer was perpendicularly rotated. The facet joint was identified and a 25 G needle was inserted into the skin by an echographic off-plane (i.e., out of plane) technique. 1 mL of non-ionic contrast was injected under ultrasonic direct visualization into the facet joint. The location of the needle tip into the facet joint was confirmed with fluoroscopy in an anteroposterior and oblique incidence. Then, the contrast was aspirated and 1 mL of solution containing 0.25% bupivacaine hydrochloride and 10 mg of methylprednisolone acetate was intra-articularly injected in real time and with ultrasound guidance. During the injection, hypoechoic distension of facet joint was observed – a phenomenon that determines the success of the procedure and that exempts the use of intravascular injection. Injections were made to the right of L3–L4, L2–L3 and L1–L2.

During her transfer to the anesthesia care unit, the patient exhibited no symptoms of pain, was cooperative and maintaining hemodynamic and respiratory stability. She was discharged, remaining in clinical follow-up in the Pain Service. The assessment of pain intensity was obtained with the use of a numerical scale of 0–10; during the next five months, her scores remained at 3 points.

Discussion

The facet joint was recognized as a cause of low back pain in 1933, and since then its treatment is being more widely discussed.^{11–13} The pain caused by facet arthrosis has specific characteristics related to the affected joint. This pain may arise in the cervical, thoracic or lumbar spine. The lumbar facet osteoarthritis pain may be radiating to the

lower limb.¹⁴ The diagnosis is mainly clinical and can be confirmed by radiological examination (CT or MRI).² The diagnosis can be confirmed by the medial branch block or by an intra-articular injection of local anesthetic with or without corticosteroids, because of the relief of pain originating from the facet.^{5,11} In some cases, the first option is a test block with local anesthetic and subsequently a corticosteroid – or a medial branch block.^{5,11}

The facet joint block is indicated for patients with low back pain for more than six months and with imaging studies (computed tomography or magnetic resonance imaging of the lumbar spine) to confirm the facet osteoarthritis. These patients must not have local or systemic infection, allergy to corticosteroids or anesthetics, coagulopathy, or be pregnant. The pain worsens with maneuvers of ipsilateral lateralization and spinal extension; the pain is relieved with contralateral lateralization and spinal flexion. Paraspinal muscle contracture may also occur. Imaging studies must be negative for vertebral tumor, discitis, disk herniation, and spinal fracture and instability.¹⁵

Currently, techniques such as fluoroscopy and computed tomography have been used to aid in positioning the needle and in the success of intra-articular injection. But both are expensive procedures; furthermore, there is a need for a suitable place for their application, and the patient is subject to radiation exposure.^{5,11} The ultrasonography has occupied an increasingly greater space in regional anesthesia and in those procedures used for the treatment of chronic pain,¹⁶ by enabling a dynamic/real-time monitoring of the approached site.¹⁵ The ultrasound-guided procedure can be done in the clinic, eliminating the presence of the radiologist, or the need of an operating room.^{5,15}

The ultrasonographic examination of the spine requires the acquisition of a sequence of images, allowing visualization of soft tissues (paraspinal muscles, ligaments and dura-mater) and bony structures. In the lumbar spine, the scan procedure begins at the sacrum, with the transducer longitudinally positioned at the midline, with an approximate 6–8" deep adjustment. The first viewed prominence is the bony crest of the sacrum as a hyperechoic signal with a bone shadow just below. The transducer is moved cephalward until a hyperechoic structure is displayed. This structure corresponds to the subarachnoid space of L5–S1 and is reflective of the CSF in the ventral dura mater. In a more cephalic level, it is possible to view other hyperechoic signal, corresponding to the spinous process of L5. The guidance of the transducer to a more cephalic region allows us to identify all the spinous processes, correlating them with the previously made skin marks. When the transducer reaches the desired site for the injection into the facet, the device is rotated 90 degrees. With this maneuver, three shadows of the lumbar vertebra are depicted. The most superficial layer is the spinous process; the facet joint is immediately below; and the transverse process is located below and laterally to the spinous process and articular facet.

In our case, we chose the combination of ultrasound with fluoroscopy. Since that ultrasonography for facet blocks is a recent procedure, the fluoroscopy was used to confirm the location of the needle and the possibility of doing the procedure with the exclusive use of ultrasound.

In conclusion, the ultrasonic visualization of the facet joint involves minimal risk and radiation reduction. But fluoroscopy and computed tomography remain as monitoring procedures indicated for patients with specific characteristics, such as obesity, severe degenerative diseases and anatomical malformations.^{11,14,16,17}

Conflicts of interest

The authors declare no conflicts of interest.

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