Incidental detection of bowel herniation with ultrasonography and fluoroscopy during a caudal block

Découverte fortuite d'une hernie intestinale par échographie et fluoroscopie pendant un bloc caudal

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Abstract

Background In contrast to fluoroscopy, ultrasonography allows visualization of structures such as muscles, tendons, vessels, and nerves. We describe a case where ultrasonography in conjunction with fluoroscopy led to the incidental diagnosis of bowel herniation in a patient undergoing a caudal block.

Clinical features A 71-yr-old woman presented to our chronic pain clinic with a long-standing history of coccydynia for which she had undergone a partial coccygectomy. A trial caudal block was planned. Fluoroscopy of the lower sacral area revealed the presence of a gas bubble inferoposteriorly to the coccygeal remnant. A confirmatory ultrasound scan revealed a hollow structure compatible with bowel. The procedure was abandoned. Subsequently, a non-enhanced computed tomographic scan of the pelvis confirmed the diagnosis of large bowel herniation. The patient was referred to a colorectal surgeon, and she subsequently underwent successful laparoscopic repair of the coccygeal hernia.

Conclusion Ultrasonography can be a valuable adjunct in identifying non-neural pathologies in patients undergoing interventional procedures in chronic pain management. This case report highlights the importance of being vigilant for unanticipated pathologies during ultrasound examinations while performing chronic pain block procedures.

Résumé

Contexte Contrairement à la fluoroscopie, l'échographie permet de visualiser des structures telles que les muscles, les tendons, les vaisseaux et les nerfs. Nous décrivons un cas dans lequel l'échographie, en conjonction à la fluoroscopie, a mené au diagnostic secondaire d'une hernie intestinale chez une patiente subissant un bloc caudal.

Éléments cliniques Une femme de 71 ans s'est présentée à notre clinique de douleur chronique avec des antécédents de coccygodynie de longue date, affection pour laquelle elle avait subi une coccygectomie partielle. Un bloc caudal d'essai avait été prévu. L'imagerie par fluoroscopie de la zone sacrée inférieure a révélé la présence d'une bulle de gaz inférieure et postérieure au coccyx restant. Un échogramme de confirmation a révélé la présence d'une structure vide compatible avec l'intestin. L'intervention a été annulée. Par la suite, une tomographie sans rehaussement du bassin a confirmé le diagnostic d'une hernie intestinale importante. La patiente a été référée à un chirurgien colorectal, et elle a par la suite subi avec succès une herniorraphie coccygienne par laparoscopie.

Conclusion L'échographie peut constituer un ajout précieux pour identifier des pathologies non neurales chez les patients subissant des interventions effractives pour la prise en charge de la douleur chronique. Cette présentation de cas souligne l'importance de garder l'œil ouvert pour détecter des pathologies imprévues pendant les examens par échographie réalisés pour un bloc pour la douleur chronique.

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Compared with fluoroscopy, ultrasonography allows for more accurate visualization of various anatomic structures, including muscles, tendons, vessels, and nerves.^{1,2} With an expanding role for ultrasonography-guided techniques for

chronic pain therapy, there is an ever-increasing potential to identify incidental but potentially important non-neural pathologies. We describe a case wherein ultrasonography in conjunction with fluoroscopy led to the incidental discovery of a bowel herniation in a patient undergoing a caudal block. Written consent for publication of this case report was obtained from the patient.

Case report

A 71-yr-old woman with hypercholesterolemia was referred to our chronic pain clinic for management of a long-standing history of low back and sacral pain. Her symptoms resulted from a fall down a flight of stairs 20 years previously. Her pain was exacerbated by a second fall 14 years later. On both occasions, radiographic imaging failed to reveal the presence of a coccygeal fracture. Nonetheless, in order to alleviate the pain, a partial surgical resection of the coccyx was performed shortly after the second fall. Post-operatively, the patient continued to have severe pain radiating to her right buttock and thigh. Pain was particularly debilitating in the sitting position. Daily pharmacological management consisting of gabapentin 1,800 mg *po*, hydromorphone 12 mg *po*, and 5% topical lidocaine gel provided minimal relief. Thus, the patient was referred to the chronic pain clinic of our hospital. On physical examination, tenderness and bogginess were noted over the lower sacral region.

After discussion and review of the related benefits and risks, the patient consented to having a caudal epidural block (with 10 mL of 1% lidocaine and 80 mg of methylprednisolone). For the procedure, standard monitors were

applied and the patient was positioned prone. Fluoroscopy of the lower sacral area revealed the presence of a gas bubble inferoposteriorly to the coccygeal remnant (Fig. 1a, b). At our institution, ultrasonography is often used in conjunction with fluoroscopy to perform caudal blocks. Thus, the sacral area was also scanned with a 14-5 MHz linear ultrasonography probe (Zone Ultra, Zonare Medical Systems, CA, USA) (Fig. 2). This revealed a hollow viscus compatible with a loop of bowel (Fig. 3a, b). The procedure was abandoned in light of these unexpected findings, as the block needle would have traversed the bowel.

Fig. 2 Position of the ultrasound probe

Fig. 1 **a** Fluoroscopy of the lower sacral area. **b** Schematic representation of the fluoroscopic image of the lower sacral area. A = gas bubble; B = coccygeal remnant; C = sacrum; D = caudal canal

Fig. 3 **a** Ultrasound image of the lower sacral area. **b** Schematic representation of the ultrasound image of the lower sacral area. A = hernial sac; B = sacrococcygeal ligament; C = sacral hiatus; D = coccygeal remnant; E = sacrum

A non-enhanced computed tomographic scan of the pelvis confirmed the fluoroscopic and ultrasound findings of large bowel herniation (Fig. 4). The patient was immediately referred to a colorectal surgeon who performed a laparoscopic repair of the perineal hernia. Intraoperatively, a 4-cm defect with rectal protrusion was identified and repaired with a mesh. The procedure was uneventful. Within two months after her surgery, the patient had a 40% reduction in sacral pain. However, the low back pain persisted for which analgesia was initiated with gabapentin and opioids.

Fig. 4 Computed tomographic scan (axial view) below the first coccygeal remnant. Arrows indicate the herniated bowel

Discussion

This case report highlights the importance of being vigilant for unanticipated pathologies during ultrasound examinations while performing chronic pain block procedures.

Defined as the protrusion of an organ (or intraperitoneal tissue) through a defect of the pelvic diaphragm into the perineum, perineal hernias can be either congenital or acquired.³ On rare occasions, they can occur after a coccygectomy.⁴ Resection of the coccyx involves detachment of the coccygeus and levator ani muscles from the pelvic unit/ axial skeleton.⁴ The two muscles lose stability, resulting in a weakened posterior pelvic floor and creating a potential space for abdominal content to herniate caudally. Surgical repair of a perineal hernia usually involves reduction of the hernial content, isolation of the fascial defect, and reconstruction of the pelvic floor.⁵ In two case reports in the literature, bowel herniation after coccygectomy^{6,7} necessitated surgical repair either by plication of the gluteus muscles inferior to the sacrum⁶ or by the use of mesh via an anterior approach.⁷ Recently, a laparoscopic transabdominal technique has been described.⁸ The latter allows faster recovery of bowel function, shorter inpatient stay, less disability, and decreased analgesic requirement.⁸ Thus, our patient underwent laparoscopic perineal hernia repair with mesh and rectopexy.

Ultrasonography has become a popular adjunct in regional anesthesia by enabling the operator to visualize, in real time, the nerve, needle, and spread of local anesthetic agent.⁹ Increasingly, the use of ultrasonography is starting to extend to the field of chronic pain management. Although fluoroscopy has been recommended traditionally for caudal blocks,^{10,11} a recent case series has reported a 100% success rate when ultrasonography was used to guide needle placement into the caudal canal.¹² Fluoroscopy defines bony landmarks accurately; however, it cannot outline soft tissue structures.^{1,2} In contrast, ultrasonography allows for visualization of structures such as muscles, tendons, vessels, nerves, and bowel. Furthermore, ultrasonography confers additional advantages because it is radiation-free, portable, and convenient to use. However, one important limitation lies in its inability to detect intrathecal injection.¹³ Thus, in our practice, ultrasonography and fluoroscopy are used jointly to perform caudal blocks. The former allows the operator to guide the needle into the caudal canal, while the latter enables the operator to rule out intravascular or intrathecal injection through spread of contrast agent.

With ultrasonography, regional anesthesiologists are now able to diagnose non-neural anatomic variants and pathologies when performing nerve blocks. For instance, deep (femoral) venous thromboses as well as atherosclerosis of the femoral and (bilateral) carotid arteries have

been diagnosed during routine scans.¹⁴ In all these cases, the incidental findings altered either intraoperative management (cancellation of surgery and avoidance of thigh tourniquet for bilateral carotid and femoral atherosclerosis, respectively) or postoperative care (systemic anticoagulation for femoral vein thrombosis).¹⁴ In this particular case, incidental discovery of bowel herniation altered therapeutic management by compelling us to abort the caudal block and to refer the patient to a colorectal surgeon. Ultrasonography proved to be a useful adjunct to fluoroscopy for the diagnosis of bowel herniation.

In conclusion, although further work is required to validate fully the use of ultrasonography for block procedures in patients with chronic pain, this case highlights the added potential of ultrasonography to identify non-neural pathologies in chronic pain management.

Competing interest None.

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