Case Report

A complication during caudal steroid injection

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Abstract. Background and objective: Epidural injections in the lumbar spine are provided by caudal, lumbar interlaminar or transforaminal routes. Caudal epidural steroid injections are often used for low back pain. Fluoroscopic guidance has been frequently cited as a requirement for this procedure. In this case report, we demonstrate the importance of fluoroscopic guidance during caudal epidural injection.

Case report: A 60 years old male patient was admitted to our Algology Department for low back pain. After physical examination caudal epidural steroid injection was planned. The caudal space was identified under fluoroscopic control initially using an anteroposterior projection. After the resultant epidurogram demonstrated vascular spread along the caudal epidural space the needle was withdrawn and the procedure was completed after reinserting the needle.

Conclusion: A careful real time fluoroscopic monitoring should be applied with the injection of opaque material to minimize the risk of vascular injection.

Keywords: Caudal injection, radioopaque, complication

1. Introduction

Epidural injections in the lumbar spine are provided by caudal, lumbar interlaminar or transforaminal routes. While interlaminar entry is considered to deliver the medication closely to the assumed site of pathology, the transforaminal approach is considered as target-specific requiring the smallest volume to reach the primary site of pathology. Caudal epidurals are considered as the safest and easiest, with minimal risk of inadvertent dural puncture, even though requiring relatively high volumes. They have also been shown to be significantly effective compared to interlaminar epidural injections [3,1]. Caudal epidural steroid injections are often used for low back pain. Fluoroscopic guidance has been frequently cited as a requirement for this procedure. In this case report, we demonstrate the importance of fluoroscopic guidance during caudal epidural injection. Thus, without the real-time imaging may result in inadvertent intravenous injection of the drug. We detected intravenous leakage of the drug in a case when real-time fluoroscopic imaging was used. Thus, real-time imaging may be recommended in addition to routine fluoroscopic guidance for caudal epidural procedures, as it may improve efficacy and safety by assuring accurate drug deposition.

2. Case

A 60 years old male patient was admitted to the Algology Department of Medical Faculty of Gulhane for low back pain due to spinal stenosis. After physical examination caudal epidural steroid injection was planned.

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Procedure was performed in the operating room under sterile conditions with fluoroscopic guidance after the informed consent was obtained. Patients received 500 mL isotonic saline solution via a 20-G intravenous catheter before the procedure. Cephazolin 1 g i.v. was given 30 minutes before the procedure for prophylaxis. Vital signs (heart rate, noninvasive blood pressure and peripheral oxygen saturation) were continuously monitored.

Patient was placed on the fluoroscopy table in the prone position with a cushion under the abdomen to facilitate access to the caudal canal. The caudal space was identified under fluoroscopic control initially using an anteroposterior projection. Next, the C-arm was rotated to the lateral position to visualize the bony canal (Fig. 1). After local anesthetic infiltration of the skin and subcutaneous tissues with 1% lidocaine, an 18-G Tuohy needle was introduced through the sacral hiatus into the caudal canal, and after negative aspiration for blood or cerebrospinal fluid, 2 mL of iohexol (Omnipaque 300 mg, Opakim, Turkey) was administered to verify the needle’s final position.

After confirmation of entrance into the caudal space, the fluoroscope was again directed to an anteroposterior view. Then, real-time imaging was recorded during the injection of 10 mL of contrast material. After the resultant epidurogram demonstrated vascular spread along the caudal epidural space the needle was withdrawn and the procedure was completed after reinserting the needle (Fig. 2). Without evidence of intravascular extravasation, 10 mL of local anesthetic (bupivacaine 0.125%) and steroid (80 mg triamcinolone) were administered as the therapeutic injection.

3. Discussion

Epidural injections of local anesthetic agents and corticosteroids are widely used to provide symptomatic relief with low back disorders [9]. Epidural steroid injections have been used since 1952 [5]. These injections can be approached by translaminar, transforaminal and caudal routes [5,10].

Even though rare, the most common and worrisome complications of caudal epidural injections are of 2 types: those related to the needle placement and those related to drug administration. Complications and side effects include infection, intravascular injection, extra epidural placement, hematoma formation, abscess formation, subdural injection, intracranial air injection, epidural lipomatosis, dural puncture, nerve damage, headache, increased intracranial pressure, vascular injury, cerebral vascular or pulmonary embolus, and effects of steroids [6].

The procedure is usually performed under fluoroscopic control to increase the accuracy of the needle placement and decrease the possibility of dural or venous puncture [2,15]. However, fluoroscopic guidance alone, without real-time imaging, may not be sufficient to confirm the accuracy of caudal epidural placements. Real-time imaging is not routinely used with caudal epidural injections. Thus, even with experienced physicians, up to %25 of the injections using the caudal route do not enter the epidural space [9,14]. Ac-
According to our experience, if fluoroscopic examination is performed after administration of the contrast medium without real-time visualization during the injection, one cannot be sure that the entire dose was delivered into the caudal epidural space. Intravenous leakage can more reliably be detected by using real-time fluoroscopic imaging like in our case.

Botwin et al. [4] reported complications of fluoroscopically guided caudal epidural injections in 139 patients, who received 257 injections. Complications per injection included insomnia the night of the injection (4.7%), transient non-positional headaches (3.5%), increased back pain (3.1%), facial flushing (2.3%), vaso-vagal reactions (0.8%), nausea (0.8%), and increased leg pain (0.4%). The incidence of minor complications was 15.6% per injection. Manchikanti et al. [11,12] reported with fluoroscopically guided caudal epidural injections intravascular placement in 14% of the patients, and fluoroscopy is medically necessary for the performance of epidural steroids. Ergin et al. [7] reported caudal steroid injections intravenous leakage in 4 of 10 cases when real-time fluoroscopic imaging was used.

Another study examined 504 cervical transforaminal epidural steroid injections and reported the overall rate of fluoroscopically confirmed intravascular contrast injections to be 19.4% [8]. Renfrew et al. [13] evaluated 316 caudal epidural steroid injections and reported intravenous injection in only 29 of 316 procedures (9.2%); however they did not use real-time imaging. In this case report, intravenous placement of the needle was similarly detected only with routine fluoroscopic control.

In conclusion, we believe that physicians should be aware of the anatomy of the caudal venous system, and should be used careful real time fluoroscopic monitoring with the injection of opaque material to minimize the risk of vascular injection during caudal injection in epidural procedures. Prospective studies with a larger sample size should be performed with real-time fluoroscopic guidance for caudal and other epidural procedures.

References