CT-guided obturator nerve block for diagnosis and treatment of painful conditions of the hip

Abstract  Obturactor nerve blocks (ONB) have been performed by anesthesiologists mainly to eliminate the obturator reflex during transurethral resections. An effect on hip pain has also been described. However, being a time-consuming and operator-dependent procedure if performed manually, it has not been widely used for chronic hip pain. The purpose of this pilot study was to check whether CT guidance could improve reproducibility of the block (= immediate effect) and to test its potential value for treatment of chronic hip pain. Fifteen chronically ill patients with osteoarthritis underwent a single ONB. Sixteen millilitres of Lidocaine 1% mixed with 2 ml Iopamidol was injected into the obturator canal. The patients were followed up to 9 months after the intervention. With a single injection pain relief was achieved for 1–8 weeks in 7 of 15 patients. Excellent pain relief for 3–11 months was achieved in another 4 patients. Reasons for a midterm or even long-term effect based on a single injection of local anaesthetic are not exactly known. The CT-guided ONB is a fast, easy and safe procedure that may be useful for midterm (weeks) and sometimes even long-term (months) treatment of hip pain.

Keywords  Intervention · CT guidance · Hip pain

Introduction

Obturactor nerve block (ONB) is a procedure that has been used by anaesthesiologists mostly for elimination of the obturator reflex (contraction of the adductor muscles) during transurethral resection of bladder or prostatic tumours [1, 2, 3]. In addition to this application, ONB has been used by anaesthesiologists for relief of adductor muscle contraction in patients with paraplegia or multiple sclerosis, and in few studies its use for diagnosis and treatment of painful conditions of the hip joint has been described [4, 5, 6, 7, 8]. Reported results have varied and the procedure has not been widely used for treatment of hip pain. This may be explained by varying innervation of the hip, but also by the fact that it is a time-consuming and operator-dependent procedure, if performed without guidance [6]. At least three techniques for the manual approach have been described in the anaesthesiology literature [8]. In these procedures the entrance point and angulation of the needle is chosen using anatomical landmarks as well as by “searching for paraesthesias to the inner thigh”, sometimes using fan-like needle insertion.

The first author became aware of the possibilities of manual ONBs during a literature search on treatment options for hip pain. The search was undertaken on behalf of a patient, who was well known to the author and who suffered from severe pain due to osteoarthritis. A first CT-guided ONB was performed as a trial of treatment after extensive patient information and after obtaining the patient’s informed consent. The CT-guided ONB was performed based on the literature concerning manual blocks after thorough study of the cross-sectional anatomy of that area.
Due to the excellent success in this patient, the small pilot study presented herein was started prospectively. The objectives of this pilot study were to check whether CT guidance can warrant easy and reliable reproducibility of anatomically correct ONB and to investigate its potential value for short, mid- or long-term treatment of painful conditions of the hip.

The obturator nerve is formed by union of the ventral branches of L2, L3 and L4 nerves. The obturator nerve first follows the medial border of the psoas muscle. Before the psoas muscle leaves the pelvis, the obturator nerve runs downward and slightly medially along the dorsal wall of the superior pubic ramus. During this course the obturator nerve enters the obturator canal (Fig. 1a). The obturator canal is formed by the dorsal and inferior surface of the superior pubic ramus cranially, by the internal obturator muscle dorsally, by the external obturator muscle ventrally and by the obturator membrane caudally. The obturator nerve and vessels leave the obturator canal and the pelvis at the obturator foramen underneath the superior pubic ramus (Fig. 1b). The obturator nerve separates into two rami. The separation mostly occurs at the level of the obturator canal. Outside the obturator canal the ramus anterior of the obturator nerve follows the adductor brevis and longus muscles. It innervates them, as well as the pectineus and the gracilis muscles, and gives off branches to the skin of the medial thigh. The posterior ramus follows the external obturator muscle, innervates the adductor brevis and magnus muscles and gives off sensory branches to the anteromedial capsule of the hip joint [6, 9, 10, 11, 12].

Other nerves, which also contribute to innervation of the hip joint, are branches of the femoral nerve anteriorly, of the sciatic nerve posteriorly and branches of the posterior gluteal nerve posterolaterally.

Materials and methods

Between November 1997 and October 1998, 15 patients underwent CT-guided obturator block. Informed consent was obtained from all patients and all patients agreed to be followed up.

The status of all patients was documented on questionnaires, which had to be filled out by the patients once before and once 3 months after the block. Furthermore, all patients were independently seen and examined by a clinician.

The questionnaire, which was given to the patients before treatment, included questions concerning the type of underlying disease, the grade of pain, character of pain, as graded by the patient before the intervention (for grades see Tables 1, 3), previous pain treatment and previous operations, as well as questions concerning pain during the block. The latter questions had to be filled out directly after the block.

Approximately 3 months after the block, the patients were contacted again and were asked to fill out another questionnaire which contained questions concerning the reduction of pain (if present), and the duration of pain reduction if applicable. The patients were asked to indicate the grade and character of (remaining) pain during this time span and further pain treatment (medication) during that time span (if used). Patients in whom the therapeutic effect lasted longer than 3 months were contacted and surveyed by phone. Furthermore, patients were also contacted by phone if answers in the questionnaire needed clarification.

All patients were also seen by the clinician before and approximately 3–4 months after the block. At both time points the clinician examined the patients using the commonly applied scale by Merle d’Aubigné, which is used to classify pain, mobility and walking ability in seven grades (see legend of Table 2).