

Relief of intractable perineal pain by coccygeal nerve block in anterior sacrococcygeal ligament after surgery for rectal cancer

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Abstract: Intractable perineal pain often appears in the anal region following abdominoperineal resection for the treatment of rectal cancer. In such cases, a subarachnoid block or transsacral block is generally used to control pain. However, these procedures sometimes cause complications such as dysuria or sensory paralysis of the pudendum. A new method of pain control is presented herein using absolute alcohol as a neurolytic agent to relieve localized perineal pain through a coccygeal nerve block in the anterior sacrococcygeal ligament. Five cadavers were necropsied to localize the coccygeal nerve. A loop consisting of S4, S5, and Co was found to exist in the space surrounded by the anterior surface of the coccygeal bone and the anterior sacrococcygeal ligament. Absolute alcohol was injected into this space. It is essential that the neurolytic agent remain localized in this space to avoid complications and to successfully block perineal pain. In all patients, we found that this method was extremely effective in blocking localized perineal pain without any complications.

Key words: Perineal pain, Rectal cancer, Coccygeal nerve, Nerve block, Alcohol

Introduction

Intractable perineal pain often appears in the anal region following abdominoperineal resection in the treatment of rectal cancer. The occurrence of such pain is often associated with osseous metastasis or the local recurrence of cancer, but many patients can continue their normal routines of daily life, if the pain is adequately controlled.

Pain control by conventional techniques often involves a subarachnoid nerve block [1,2] or a transsacral nerve block [3,4] using a neurolytic agent. However, with the subarachnoid block, patients must be main-

tained in a fixed position for a long period of time. A positional change causes unwanted persistent nerve block. With a transsacral block, the effectiveness of the procedure is uncertain [5]. The individual anatomical differences in the sacral bone possibly cause inadequate spread of a neurolytic solution. These procedures sometimes cause complications such as sensory paralysis of the pudendum, dysuria, or weakness in the lower limbs [6-8].

The aim of this study was to evaluate the usefulness of a novel method using alcohol to reduce intractable pain through a coccygeal nerve block in the anterior sacrococcygeal ligament.

Patients and methods

A coccygeal nerve block was applied in the anterior sacrococcygeal ligament in seven patients with intractable perineal pain following abdominoperineal resection ($n = 5$) or low anterior resection ($n = 2$) for rectal cancer. Each patient was given a full explanation of the methods of this clinical treatment, and informed consent was obtained from each patient.

Patients were stabilized in the prone position while a fluoroscopic examination was conducted. A 23G needle was inserted into the space between the anterior sacrococcygeal ligament and coccygeal bone through the posterior sacrococcygeal ligament from the dorsal face at the level of the sacrococcygeal joint or at the first and second coccygeal joint. The tip of the needle was positioned near the frontal face of the coccygeal bone in a lateral view under fluoroscopic examination (Fig. 1) and 1 ml of 1% mepivacaine was injected to confirm the functional anatomical location.

After confirmation of the pain relief with the injection of 1% mepivacaine, 1 ml of absolute alcohol was injected through the same needle maintained in the same position. Thereafter, patients were instructed to lie still in the supine position for 30 min.

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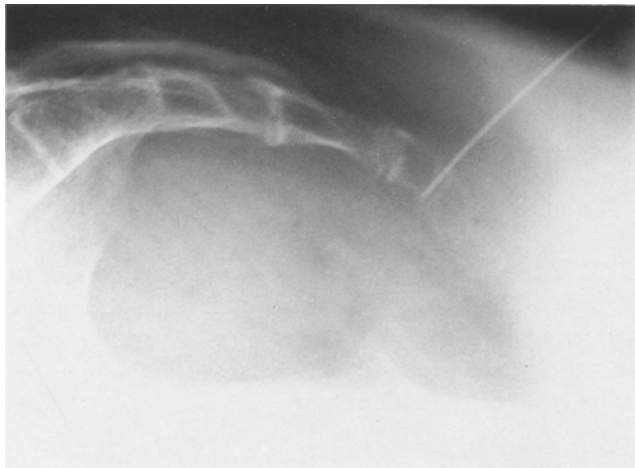


Fig. 1. Tip of needle is positioned near frontal face of coccygeal bone in lateral view under fluoroscopic examination

Results

The coccygeal nerve block in the anterior sacrococcygeal ligament produced an adequate relief of localized intractable perineal pain in all patients. The analgesic effect lasted 3–11 months without complications such as sensory paralysis of the pudendum, dysuria, or weakness in the lower limbs. Some patients complained of slight perineal pain during their terminal stage, but it could be relieved with an oral nonsteroid anti-inflammatory drug.

Initially, our blocking method was used only in patients who had undergone colostomy. Later, it was applied to patients who had an intact anus. The patients who underwent low anterior resection did not experience any rectal dysfunction. Also, they reported no reduction in normal sensation in the intact anus despite the absence of perineal pain.

Discussion

The coccygeal nerve is often described as passing through the sacral hiatus running along the dorsal surface of the coccygeal bone, turning around the base of the coccygeal angle, and passing between the first and second coccygeal vertebrae [9–12]. As Poirier and Charpy stated [13], the coccygeal nerve, which passes between the coccygeal vertebrae, enters the adipose tissue surrounding the sacrotuberous ligament where it unites with the 5th sacral nerve. Sicard and Bruezière [14] reported that the coccygeal nerve anastomosed with the 4th and 5th sacral nerves in the sacral canal.

We necropsied five cadavers to explain the clinical improvement obtained with the blocking method. We found the existence of a space which is surrounded by

the anterior surface of the coccygeal bone and the anterior sacrococcygeal ligament. And, in two of the five, we found an anatomical variance that the coccygeal nerve anastomoses and forms a loop with the 4th and 5th sacral nerves in the space (Fig. 2). The report by Sicard and Bruezière does not mention the existence of a loop consisting of S4, S5, and Co in this space.

The blocking method described in this study uses absolute alcohol, and it only affects that part of the coccygeal nerve that loops through the anterior sacrococcygeal ligament.

To perform a coccygeal nerve block, it is essential that the tip of the needle be maintained precisely in the correct position. Prior to injecting a small amount of neurolytic agent, we confirmed in a lateral view under fluoroscopic examination that the tip of the needle was near the frontal face of the coccygeal bone. This is essential to avoid complications and ensure that the neurolytic agent remains localized in the enclosed space. As a result, this blocking method did not lead to rectal disorders even in patients with an intact anus.

The pudendal nerve involved in vesical function consists of S2 and S3. Moreover, the loop consisting of S4, S5, and Co in that space does not participate in the innervation of the anal sphincter, but rather in the innervation of a sensory nerve in the coccygeal region. Since our blocking method affected only the coccygeal nerve and its loop, it had no effect on vesical function controlled by S2 and S3.

The volume of neurolytic agent to be injected into the space was determined through the use of contrast media under fluoroscopy. A roentagenogram revealed that when 1 ml of contrast media was injected after a diag-

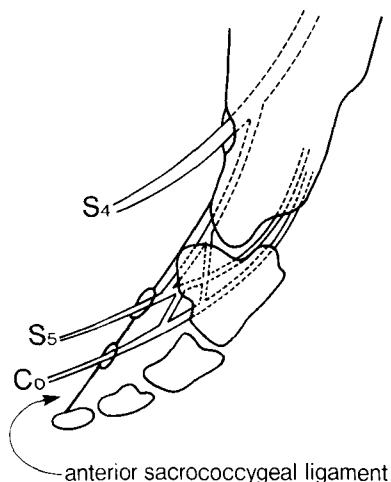


Fig. 2. Coccygeal nerve is already anastomosed, forming a loop with the 4th and 5th sacral nerves in the space surrounded by anterior surface of coccygeal bone and anterior sacrococcygeal ligament before penetrating the anterior sacrococcygeal ligament

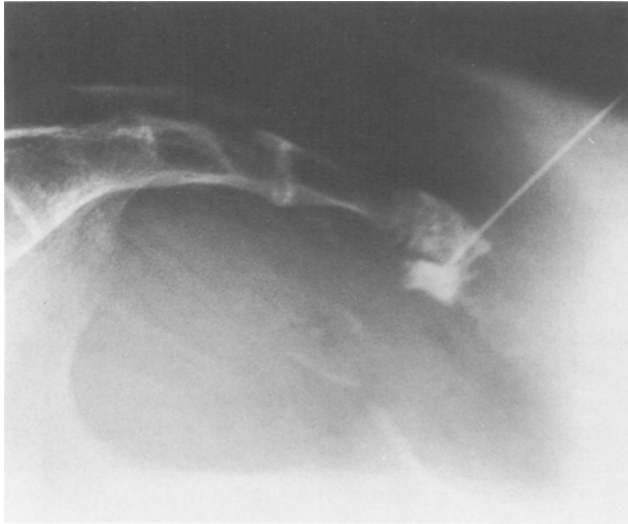


Fig. 3. Roentgenogram reveals that 1 ml of contrast media injected after diagnostic block with 1 ml of local anesthetic is localized in the space surrounded by the anterior surface of the coccygeal bone and anterior sacrococcygeal ligament

nostic block with 1 ml of local anesthetic, the space was well filled (Fig. 3). When more than 2 ml of contrast media was used, the media leaked outside the space. With this finding, we concluded that the maximum volume that can be injected into this space is 2 ml.

If pain was not successfully controlled by a single injection, we assumed either that the alcohol was not injected into the correct space or that 2 ml was insufficient for some patients. In such cases, several additional attempts to block the coccygeal nerve using this method became necessary.

Absolute alcohol was used as the neurolytic agent in our procedure because its effect is both profound and long-lasting. The effect of phenol is both less pronounced and shorter-acting. Moreover, phenol is not commercially available in preparations for use as a neurolytic block.

The disadvantage of using alcohol as a neurolytic agent is that patients sometimes experience burning pain after an alcohol injection, even though they have been pretreated with a local anesthetic. This may be due to either the diffusion of alcohol to surrounding tissues because the 2 ml injection (1 ml mepivacaine and 1 ml alcohol) exceeds the capacity of the space, or if the tip of the needle is dislocated while alcohol is being injected. It is advisable to pretreat patients with an extradural sacral block for the pain caused by the alcohol injection.

We investigated the effectiveness of the coccygeal nerve block using alcohol in the anterior sacrococcygeal ligament for relief of intractable perineal pain. Our blocking method relieved patients of localized intractable perineal pain and caused no complications such as dysuria or sensory paralysis of the pudendum.

We consider this method to be extremely useful because site-specific perineal pain can be selectively blocked, the technique is simple, there is no danger of infection in the intrathecal or extradural space, there is no need to keep the patient immobilized for a long time after the procedure, and the block can be applied repeatedly on an outpatient basis.

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