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Development of a protocol for pain management in patients undergoing uterine artery embolization

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Summary We have described the development of our protocol for patients undergoing UAE, the basis of which is PCEA and multi-modal treatment of nausea/vomiting. With implementation of this protocol, we have moved closer to meeting our goal of making UAE an outpatient procedure.

1. Introduction

Management options for fibroid disease now include uterine artery embolization (UAE). This procedure involves percutaneous cannulation of the femoral artery with a pigtail catheter guided into the bilateral uterine arteries. The arteries supplying the fibroid are then selectively embolized. UAE causes a selective infarction of fibroid tumours, and provides a fairly rapid reduction in symptoms (such as abdominal pressure or menorrhagia). The embolization is frequently performed with local anaesthesia and intravenous sedation administered under the direction of the radiologist, in the radiology suite, without involvement of anaesthesia departments. Post-procedural pain may be significant and almost universally requires systemic opioid use [1,2]. It is thought that this pain is due to fibroid infarction, and possibly due to transient global uterine ischemia [3]. Additionally, nausea is a frequent symptom experienced by these patients.

We have cared for 24 patients undergoing UAE. During our experience with these patients,

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we have developed and revised a protocol for managing post-UAE pain. Our goal is to provide readiness for hospital discharge the same day as the UAE, thus minimizing costs while improving analgesia. We describe the management of two patients who underwent UAE and describe their pain management provided. We then discuss the advantages and disadvantages of our developed regimen, and present some areas for further investigation.

2. Protocol

2.1. Pre-UAE

Once intravenous (IV) access is obtained, dexamethasone 8 mg IV and rofecoxib 50 mg orally are administered. An epidural catheter is placed at approximately the T10 level. The epidural is shown to be functional by establishing a sensory level with 10 ml 1% lidocaine. A patient controlled epidural analgesia (PCEA) infusion is begun with 0.1% bupivacaine 8 ml hr^{-1} (with three additional ml every 20 min by patient demand as necessary). A topical scopolamine patch (1.5 mg) is applied. The patient is brought to the radiology suite.

2.2. UAE

The UAE is then performed by the interventional radiologist using locally administered lidocaine 1%. Conscious sedation (midazolam 0.5—1 mg IV, as needed for anxiety) is administered under the direction of the radiologist.

2.3. Post-UAE

Following the UAE, dolasetron 12.5 mg (IV) and oxycodone SR 10 mg (orally) are administered. As needed medications include: acetaminophen (325 mg) and codeine (30 mg) oral tablets; metoclopramide 10 mg IV; and promethazine 12.5 mg IV. Six hours following the completion of the UAE, the epidural infusion is stopped. If the patient is comfortable 3 h later, the epidural catheter is removed and the patient is discharged home with the following medications: rofecoxib 50 mg orally each day for 3 days, then 25 mg daily for 4 days; oxycodone SR 10 mg every 12 h for 5 doses; and acetaminophen (325 mg) with codeine (30 mg), 2 tablets every 4 h as needed. If the patient has pain (verbal analog score (VAS) score $\geq$3) or nausea at 9 h post-UAE, the epidural PCEA infusion is re-established and the patient is admitted to the hospital overnight.

3. Case reports

3.1. Case 1

A 41-year-old female presented with a 3-year history of heavy menses and an enlarged fibrotic uterus. Past medical and surgical history was negative. On admission for uterine artery embolization, she received rofecoxib 50 mg po. An epidural catheter was placed at the T10-11 level. The epidural was tested with lidocaine as per protocol, however, the infusion was not started at the patient's request. The patient wanted to ''go natural'' at first. The UAE was performed without sedation in accordance with the patient's request. Following the 2-h procedure, she reported a verbal analog score (VAS) of 10 and requested that the epidural infusion be started. The patient self-administered several boluses from the 0.1% bupivacaine PCEA. Additionally, a bolus of 10 ml 1% lidocaine was given. The VAS was 1 at 1 h post-procedure, and 4 at 4 h post-procedure. The patient experienced significant nausea. Dolasetron 12.5 mg IV was administered and a scopolamine patch was applied. Six hours post-procedure, the epidural infusion was stopped and the patient was given oxycodone SR 10 mg. At 9 h post-procedure, the patient reported a VAS of 10. The epidural infusion was restarted, along with a 10 ml bolus of 1% lidocaine; the VAS score decreased to 0. She was subsequently admitted to the hospital for pain management. The following morning the epidural infusion was stopped, oxycodone SR 10 mg and rofecoxib 50 mg were administered orally. Four hours later the patient reported a VAS of 0, and the epidural catheter was removed. She was able to urinate without difficulty, and was discharged to home.

3.2. Case 2

A 54-year-old female was scheduled for elective uterine artery embolization for vaginal bleeding from a large uterine fibroid. Past medical history was significant for hypertension, gastroesophageal reflux disease, arthritis, and hypothyroidism. Surgical history included a myomectomy for uterine fibroids. At 7:00 a.m. she received rofecoxib 50 mg po, dexamethasone 8 mg IV, and a scopolamine transdermal patch. An epidural catheter was placed at the T9-10 level. Following an epidural test dose, an epidural infusion was started as per protocol. Uterine artery embolization was performed in the interventional radiology suite with a total of 5 mg midazolam given for sedation. The patient reported a verbal analog score of 0 at the end of the 1-h procedure. Upon return to the medical floor,