Monitored Anesthesia Care Primarily Using Dexmedetomidine Provides Safe Sedation and Analgesic Effect in Uterine Artery Embolization: A Case Report

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INTRODUCTION

Since its introduction in 1995, uterine artery embolization (UAE) has established itself as a viable choice for treating symptomatic leiomyomas [1]. Moreover, UAE has emerged as a prospective treatment approach for patients with symptomatic adenomyosis [2,3]. Although the technique of UAE is generally regarded as a safe and well-tolerated, procedures such as trans arterial chemoembolization (TACE) or UAE performed in interventional radiology are typically accompanied by post-embolization syndrome (PES). While in TACE for hepatocellular carcinoma treatment, the severity of PES tends to be milder due to the liver’s dual blood supply, the degree is notably more severe in the case of UAE. Furthermore, the symptoms of PES after UAE procedure tend to follow a typical pattern. Most UAE patients do not develop pain until after the procedure has concluded. It is during the recovery period that patients frequently need significant doses of narcotics and analgesics to alleviate the pain. This report elucidates the application of MAC using dexmedetomidine in UAE, aimed to maintain adequate sedation during procedure and reduce severe pain after procedure.

Keywords: Dexmedetomidine; Uterine artery embolization; Post-embolization syndrome; Case report

CASE REPORT

A patient underwent MAC in UAE for uterine adenomyosis. Her age was 44 years old, body mass index was 22.9 kg/m², and her parity was 2. She presented with clinical symptoms including dysmenorrhea and menorrhagia. At Samsung Changwon Hospital, UAE procedures have been conducted under local anesthesia by a radiologist. However, in the case of this patient, due to a strong preference for deep sedation and pain control, the anesthesia department was consulted. The patient had no chronic diseases or abnormal findings in preoperative tests. Given the importance of can be reduced. Therefore, monitored anesthesia care (MAC) may be useful in UAE to relieve anxiety about the procedure itself and pain [4-6]. In particular, especially in the case of the UAE, effective management of severe pain due to PES is of utmost importance [2]. Therefore, we utilized dexmedetomidine, which possesses both sedative and analgesic properties, to administer MAC anesthesia. We report the case of this approach.
managing severe pain caused by PES in UAE procedures, dexmedetomidine was chosen as the primary agent for MAC anesthesia. Furthermore, it was decided to initiate drug delivery through patient-controlled analgesia (PCA) from the pre-procedure period. One hour prior to the scheduled UAE procedure, the patient received an intravenous (IV) drip infusion in her arm while in the ward. An IV PCA pump was connected to the IV line, loaded with 1,500 mcg of fentanyl, 60 mg of nefopam, and 200 mcg of dexmedetomidine at 1 mL/hr with a 1-mL bolus dose, and a set to a lock-out time of 8 minutes. This was maintained during and after the procedure. The patient entered the angiography suite and was placed in the supine position. Standard monitoring was performed, which included electrocardiography, non-invasive blood pressure monitoring, and pulse oximetry. The forehead was cleaned with a 70% alcohol swab, and a bispectral index (BIS) monitoring (BIS-XP monitor; Covidien, Minneapolis, MN, USA) sensor was attached. Throughout the procedure, the patient received oxygen at a rate of 4 L/min via facemask. After obtaining baseline data on vital signs, 3 mg of midazolam and 0.3 μg/kg/hr of IV dexmedetomidine were administered until the BIS value reached 60. Before the local anesthesia inguinal injection for femoral artery puncture, 0.5 μg/kg/hr of IV dexmedetomidine was administered. The drug levels were adjusted to maintain a BIS value of 60–80 (ensuring sedation during the operative period); continuous vital sign and oxygen saturation monitoring was performed during MAC. The MAC was performed by anesthesiologist. After embolization of the first uterine artery, 30 mg of ketorolac was administered to manage postoperative pain; following embolization of the other uterine artery, IV dexmedetomidine was discontinued. After the UAE procedure, the patient was moved to the post-anesthesia care unit, where both her mental status and vital signs were carefully monitored prior to her return to the ward. There were no complications related to MAC. Pain within 24 hours of the procedure was primarily managed through an IV PCA pump instilled before the procedure. If necessary, nonsteroidal anti-inflammatory analgesics were additionally administered intravenously and oral analgesics were simultaneously prescribed.

The UAE procedure process is as follows: A unilateral groin approach employed under local anesthesia. A 5F Roberts uterine catheter (Cook, Bloomington, IN, USA) was inserted into the iliac artery, and a coaxial 3F microcatheter (Stride Hi-flow; Asahi Intec Co. Ltd., Osaka, Japan) was then advanced distally into the uterine artery. Sequentially, particles (Contour; Boston Scientific, Marlborough, MA, USA) of 150–250 μm, 250–355 μm, and 355–500 μm were utilized. These particles were mixed in 40 mL of a 1:1 mixture of saline and contrast agent (Iomeron; Bracco, Milano, Italy). The bilateral uterine arteries underwent embolization.

The day after the procedure, a patient was asked to report their degree of satisfaction on a scale of 1 (very dissatisfied) to 5 (very satisfied) regarding the sedation and pain management. The scores were divided into five levels: very dissatisfied (score of 1), dissatisfied (score of 2), neutral (score of 3), satisfied (score of 4), and very satisfied (score of 5). The patient responded as very satisfied (score of 5) and was discharged on the second day after procedure. Written informed consent was obtained from our patient for the publication of this report.

**DISCUSSION**

Preprocedural anxiety often begins as soon as the radiologic procedure is scheduled. Women tend to experience more anxiety than men, and patients scheduled for vascular procedures exhibit higher levels of anxiety compared to those scheduled for non-vascular procedures [7]. Concerns about pain and embarrassment during the procedure are common. Procedures like TACE or UAE, performed in interventional radiology are typically accompanied by PES. PES is the constellation of symptoms experienced by patients who have infarcted all or a portion of an organ [2,3]. It usually includes pain, nausea, and/or vomiting, fever, fatigue, and malaise. The cause of PES is believed to be ischemia of the treated organ. In the case of UAE, the main source of pain is attributed to ischemia in the normal myometrium. The symptoms of PES after a UAE procedure follow a typical pattern. Pron et al. [8] indicated that intraprocedural pain was 0/10 in 70% of the women. However, the postprocedural pain could be severe, with a mean pain score of 7/10 (± 2.47) and a mean hospital stay of 31.2 hours. MAC is a specialized anesthesia service utilized for diagnostic or therapeutic procedures conducted under local anesthesia, accompanied by sedation and analgesia. An essential component of MAC involves the assessment of anesthesia needs in the periprocedural period, encompassing an understanding of the patient’s coexisting medical conditions, as well as the management of the patient’s actual or anticipated physiological abnormalities that might arise during the diagnostic or therapeutic procedure [4–6]. While MAC may include the administration of sedatives and/or analgesics commonly employed for moderate sedation, the qualified anesthesia pro-
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In conclusion, MAC primarily using dexmedetomidine provides safe conscious sedation and analgesic effect when used for patients who are anxious about UAE procedure and pain. Therefore, if MAC is applied to UAE, patients will be able to receive treatment more comfortably.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES