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Case Report

Uterine Artery Embolization for Multiple Uterine Fibroids in a Quadriplegic Patient at Risk for Autonomic Dysreflexia – A Case Report

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Abstract

Uterine artery embolization is a safe alternative treatment for symptomatic uterine fibroids. Autonomic dysreflexia is an acute potentially life threatening syndrome associated with high spinal cord injury. We report the multidisciplinary management of a 39 year old patient with long standing incomplete quadriplegia from spinal cord injury secondary to seventh cervical vertebra fracture and history of autonomic dysreflexia, who underwent uterine artery embolization for multiple uterine fibroids. A combined spinal epidural anesthesia along with intravenous sedation was used during the procedure. Patient controlled epidural analgesia was used for providing post-procedural pain relief for 24 hours. Using the above approach we were able to successfully avoid triggering of autonomic dysreflexia in this patient with a high spinal cord injury undergoing uterine artery embolization.

Keywords: Uterine Artery Embolization; Spinal Cord Injury; Autonomic Dysreflexia

Introduction

Uterine fibroids are the most common benign tumors of the female genital tract [1,2]. Hysterectomy has been the definitive treatment for symptomatic fibroids, but currently uterine artery embolization (UAE) is being increasingly used as a safe and effective alternative [3,4]. Autonomic dysreflexia (AD) is an acute syndrome of excessive uncontrolled sympathetic stimulation commonly occurring in patients with spinal cord injury (SCI) at or above the sixth thoracic vertebra (T6) which is triggered by a noxious stimulus below the neurological level of injury [5-8]. We present the case of a 39 year old patient with high SCI and a history of AD who was referred to the interventional radiology department to undergo UAE for severe menorrhagia secondary to multiple uterine fibroids. To our knowledge, this is the first such case reported in the literature of UAE being performed on a patient with cervical SCI and concern of AD being triggered as a consequence of the procedure.

Case Report

A 39 year old woman with cervical SCI and quadriplegia was referred to the interventional radiology department to undergo UAE for uterine fibroids and severe menorrhagia. The largest fibroid measured 4.7 x 3.5 x 5.7 cm (Figure 1). The patient was involved in a motor vehicle accident 17 years ago and suffered a seventh cervical vertebra fracture and SCI with incomplete quadriplegia, American Spinal Injury Association (ASIA) Impairment scale B (Table). She had intact touch and position sensation in all four extremities and partial motor function in her upper extremities and drove a car with customized adaptations. She had no motor function in the lower extremities. Her past medical history was significant for episodes of AD triggered by bladder distension. She self catheterized approximately every six hours to empty her urinary bladder. She had a Mallampati class 1 airway with good range of motion of her neck. Her admission laboratory results were unremarkable.

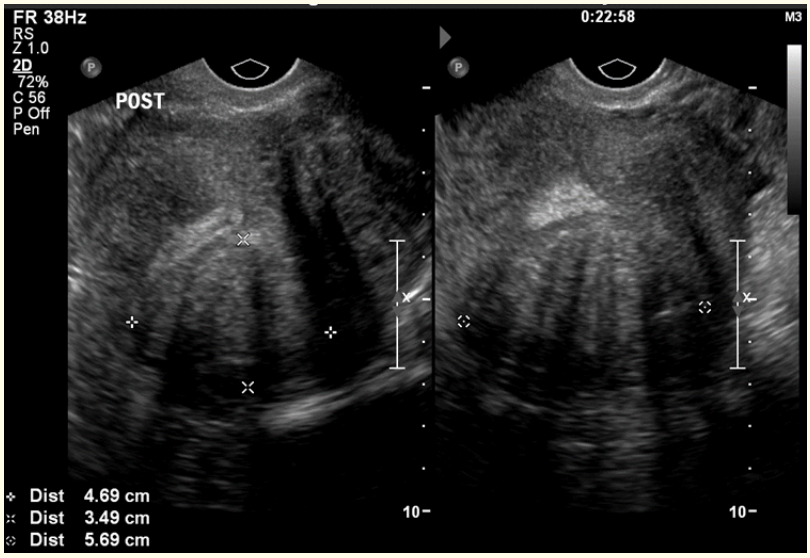

Figure 1: Ultrasonogram showing the dominant uterine fibroid.

Legend: Uterine fibroid measuring 4.69 X 3.49 X 5.69 cm.

Category	Description
A = Complete	No motor or sensory function is preserved in the sacral segments S4-S5.
B = Incomplete	Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5.
C = Incomplete	Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3.
D = Incomplete	Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade of 3 or more.
E = Normal	Motor and sensory functions are normal.

Table 1: Asia impairment scale.

Because of the risk of triggering AD as well as the added pain and cramping related to the procedure, it was decided to perform UAE under combined spinal epidural (CSE) anesthesia along with intravenous (IV) sedation. Under standard monitoring the patient was administered 13.5 mg of hyperbaric bupivacaine intrathecally. A T6 dermatome level block was achieved which was assessed with difference in perceiving touch sensation between blocked and unblocked dermatomes. The UAE lasted for 60 minutes and the epidural catheter was not dosed during the procedure. She received IV sedation with midazolam 2 mg and fentanyl 100 mcg. In addition, she also received IV ketorolac 30 mg after embolization of each uterine artery (a total of 60 mg). Using a percutaneous right femoral artery approach, both the uterine arteries were successfully embolized using embospheres (size 500 to 700 microns). There were no complications and the patient tolerated the procedure well. The patient was admitted for 24 hours and she received patient controlled epidural anesthesia (PCEA) for post procedural pain and cramping. Bupivacaine 0.08% was used for the PCEA with basal rate of 8 ml/hour, PCEA bolus of 8 ml, lockout interval of 8 minutes, and one hour limit of 24 ml. She remained pain free throughout this period with no episodes of AD. The epidural catheter was removed after 24 hours and she was discharged to home on oral pain medications. The patient was contacted by telephone for follow-up after one week and she was doing well with no significant complaints.

Discussion

AD usually becomes evident a month or more after the SCI [9]. The incidence ranges from 48% to 83% in patients with complete and incomplete SCI [5,6]. In Patients with high SCI, there is a disruption of the descending central sympathetic inhibitory pathways. Therefore common triggers like bladder and bowel distension, anal fissures, urologic procedure, urinary infections, menstruation, pregnancy and labor, ingrown toe nails, sexual activity and other traumatic stimuli can result in unopposed massive sympathetic discharge, and peripheral and splanchnic vasoconstriction below the level of lesion. This leads to hypertension, headache, bladder and bowel contractions, cold lower extremities and in severe cases atrial fibrillation, retinal hemorrhage, intracranial hemorrhage, seizures, pulmonary edema and death [5-8]. To counteract the hypertension there is reflex vasodilatation above the lesion leading to sweating, skin flushing, nasal congestion, piloerection and bradycardia [5,8]. Sometimes tachyarrhythmias are also observed, possibly due to increased catecholamine receptor activity above the lesion [9].

AD warrants early recognition and prompt treatment to prevent complications. For clinical use, suggested criteria for AD reaction are: increase in systolic blood pressure by at least 20%, combined with at least one of the following symptoms: sweating, chills, cutis anserina (piloerection), headache or flushing [6]. Treatment comprises identification and removal of triggering factors and symptomatic management of hemodynamics [8]. The patient should be placed in the upright or sitting position to prevent further increase in the blood pressure[6-9]. If these measures fail to control the blood pressure, pharmacotherapy (sublingual captopril or nifedipine, glyceryl trinitrate spray or intravenous hydralazine) should be initiated.

Since first described by Ravina., *et al*. in 1995, UAE has come a long way and has become a valuable nonsurgical alternative for the treatment of uterine fibroids [3,4,10]. The National Institute for Clinical Excellence (NICE) and the American College of Obstetricians and Gynecologists have both recently endorsed UAE as an acceptable alternative to hysterectomy [11]. UAE is a fluoroscopically guided technique in which a catheter is introduced into the uterine arteries via the femoral artery and an embolic agent is injected to occlude them (Figures 2 and 3). This decreases the blood supply of the uterine fibroids causing them to shrink and reduce in size by 42% to 83% [2,12]. As compared to hysterectomy and myomectomy, UAE is more cost effective and patients have a shorter hospital stay, faster recovery and lower rate of major complications [1,2,4,12,13].

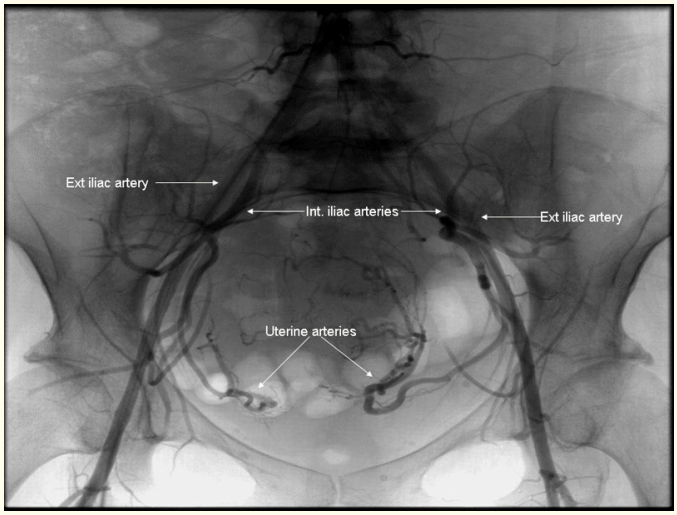

Figure 2: Pre-embolization pelvic arteriogram.

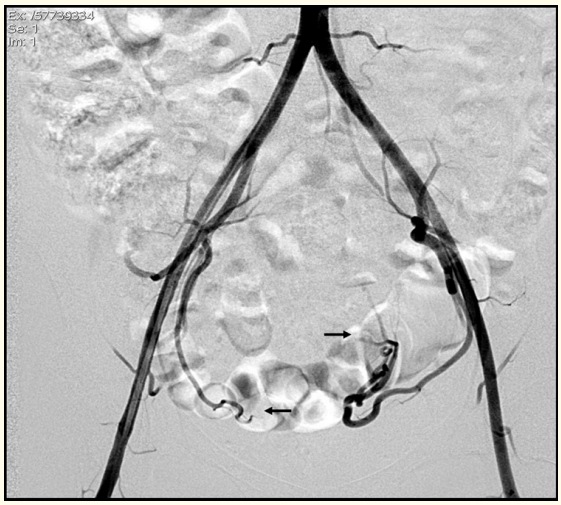

Figure 3: Post-embolization pelvic arteriogram.
Legend: Arrows represent post-embolization obliteration of the flow.

Our patient who was having severe menorrhagia due to multiple uterine fibroids was referred to the interventional radiology department to undergo UAE. In our hospital UAE is routinely per-

formed under local anesthesia and mild IV sedation, and IV ketorolac after embolization of uterine arteries. Most patients undergoing UAE suffer from some degree of acute pain which often starts at the time of embolization and can last up to twenty four hours. In this case, use of IV sedation and local anesthesia would not reliably prevent the postembolization pain which could also potentially trigger AD. Because of this concern, the anesthesiology department was consulted. Patients at risk for AD are protected from intraoperative hypertension by either general or spinal anesthesia and not by IV sedation and local anesthesia [14]. Henceforth it was decided to proceed with the procedure under CSE anesthesia and IV sedation and to use PCEA for post procedural pain relief.

Conclusion

In conclusion, a high level of awareness for AD is needed, and using the above described approach of CSE anesthesia and IV sedation, we were successfully able to manage this patient with a cervical SCI prone to AD who underwent UAE for symptomatic uterine fibroids.

Conflict of Interest

The authors declare no other conflicts of interest that may affect the information and recommendations presented in the manuscript.

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