A CASE OF VENOUS AIR EMBOLISM DURING TRANSURETHRAL RESECTION OF THE PROSTATE

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Venous air embolism is a rare complication during transurethral resection of the prostate (TURP). We report a case of air embolism during TURP under general anesthesia in a 56-year-old man. Incorrect assembly of the resectoscope-drain aspiration system caused rapid entrainment of air into the vein of the prostate bed. Rapid recognition of the condition and prompt treatment are required.

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Key words : Transurethral resection of the prostate, Venous air embolism

INTRODUCTION

Venous air embolism is a rare complication during transurethral resection of the prostate (TURP). Fatal cases of massive air embolism have been reported[1,2]. It is very important to understand the various complications associated with TURP. We report such a case occurring in a healthy 56-year-old male.

CASE REPORT

A 56-year-old male was referred to our department for TURP due to symptomatic urinary outflow obstruction. Preoperative testing and laboratory findings were negative. General anesthesia with a laryngeal mask airway was induced with propofol, and was maintained with sevoflurane and nitrous oxide in 40% oxygen. Approximately several grams of prostatic material were resected within five minutes using a continuous irrigation resectoscope system with a continuous roller aspiration pump. Because the irrigation fluid was bloody despite continuous irrigation-drainage and air bubbles were noticed in the bladder, we stopped the surgical procedure and checked the equipment. The inflow and outflow lines to the roller pump had been connected in reverse (Fig. 1). A large amount of air was present in the bladder. Then the tubing was reconnected in the proper fashion. At that time, the patient's arterial saturation decreased to 70% and heart rate decreased from 80 bpm to 60 bpm. We thought the situation could be due to air embolism. The patient was ventilated with 100% oxygen. The laryngeal mask was removed, and the trachea was intubated. Epinephrine infusion and an arterial line insertion were started. A right internal jugular 7F triple lumen catheter was placed and we tried to aspirate the air, but this was unsuccessful. The arterial saturation improved to 97% with increased blood pressure. The patient was transferred to the intensive care unit. The general condition stabilized and ultrasound of the heart was notable for the normal regional wall motion and absence of air in the right ventricle. He was extubated 4 h postoperatively. Neurological findings were normal. The patient was discharged from the hospital six days after TURP. Three months later he was admitted for re-TURP. Fifteen grams of material were resected and he has neither voiding difficulty nor long-term complication as a result of the air embolism.

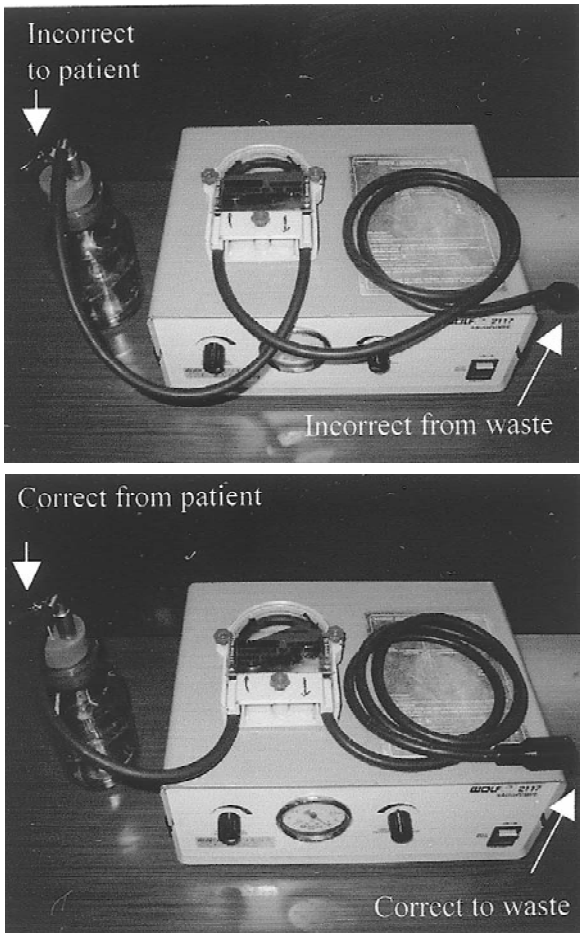

Fig. 1. Irrigation pump with incorrectly connected (A) and correctly connected (B).

DISCUSSION

There have been several reports of fatal air embolism during transurethral surgery. Use of the Ellik evacuator to rinse the bladder or irrigation using a Foley catheter with an air-filled 60 ml syringe could introduce massive air under pressure into the open venous sinuses of the prostate or bladder neck[1,2]. Tsou et al. reported a fatal gas embolism that occurred during transurethral incision of the bladder neck[3]. They confirmed the embolism by aspiration of frothy blood through the central venous catheter, as well as by a massive gas embolism in the right atrium on a transesophageal echocardiogram. They did not describe the source of massive gas. Another reported case of air embolism during TURP was due to incorrect assembly of the bladder irrigation-resectoscope-drain system, which led to a rapid entrainment of air into the open venous channels of the prostate bed[4]. The system was designed to drain fluid from the bladder via a continuous roller pump. The present case was the second case of air embolism during TURP associated with the incorrect use of a drainage pump system. Attempts were made to aspirate the gas from the central venous catheter, but failed. We thought the case was an air embolism because massive gas flowed out from the bladder when we extracted the resectoscope from the sheath. The volume of gas that is lethal to humans is unknown, but accidental injection of approximately 200 ml air has been fatal[5]. The volume of gas that entered the venous system in the present case is unknown. It seems that the amount of gas that our patient received was small because the patient's condition improved quickly after intubation and central venous catheterization. We have since performed TURP without a continuous roller pump system. In conclusion, we report a case of gas embolism during TURP. The source of the air was an incorrectly assembled irrigation-resectoscope-drain aspiration system. Rapid recognition of the condition and prompt treatment are required.

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和文抄録

経尿道的前立腺切除術中に空気塞栓をきたした1例

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56歳，男性．経尿道的前立腺切除術（TURP）開始後すぐに突然の血中酸素分圧の低下，脈拍低下をきたし，空気塞栓として治療した．廃液システムのポンプと廃液管の接続違いにより空気が膀胱内に注入されたものと思われた．TURP中の空気塞栓は稀な合併症だが，病態の認識と迅速な対応が必要である．

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