Case Report

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Bladder Explosion, a Serious Complication Occurred During Transurethral Resection of Prostate

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Abstract

A case of bladder explosion with three wide ruptures that occurred during transurethral resection of prostate (TURP) is being reported. Immediate open surgical primary repair of bladder rupture can be obtained without any complication. On the review of the literature, it was found that a limited number of cases have been reported. The main mechanism has been reported as the explosion of the gases, which was produced during electro cauterization and mixed with air oxygen from the atmosphere. A bladder explosion is a rare complication, which can occur during a very common surgical procedure in urological practice. Urologist should alert of the sounds that can be heard during TURP and organ rupture possibility should always be kept in mind as immediate surgical repair is critical for the patient and surgeon.

Keywords: TURP, bladder explosion, bladder injury

Introduction

Bladder eruption is a very rare complication during transurethral resection of prostate (TURP) procedure. There are very few case reports in the literature. However, although it is a rare complication, it can be an important life-threatening situation. Urologists should always be very careful and eliminate the possible complication urgently.

Case Report

This is a retrospectively evaluated case report of a 68-year-old male patient who was operated because of recurrent urinary bleeding and pronounced difficulty in urinating. TURP operation was applied to the patient without any obvious pathology that could cause bleeding in his bladder on cystoscopy. When approaching the termination of the operation after about half an hour period, a sudden booming sound was heard simultaneously by the coagulation procedure for a small bleeding focus at 11 o'clock and we observed that the endoscopic image suddenly disappeared. The patient was considered as having a bladder perforation and was immediately under general anesthesia open surgical exploration through a suprapubic "Pfannenstiel" incision was performed. We observed that the bladder had been burst by tearing a full floor from 3 different regions and the peritoneum was opened, with luck there was no pathology of the intestines. The bladder and peritoneum ruptures were primary repaired. During the postoperative follow-up, the patient was discharged from the clinic without any problem.

Discussion

The first bladder eruption was reported by Cassuto in 1926 after TURP (1). Bladder injuries that may occur can range from mild mucosal tears to severe tears such as extraperitoneal or intraperitoneal bladder ruptures.

In all reported cases, an explosive sound was reported to be heard almost at the end of surgery and mostly when cauterizing particularly the anterior prostatic fossa. One of the important points is that nearly in all cases intraperitoneal injury (2).

In the etiology of the explosion, it is emphasized that the gases that released during the diathermic surgery in human tissue and accumulated in the bladder dome come into contact with oxygen that is present in the ambient air. Especially the combination of hydrogen and oxygen is critical. It is anticipated that the electric current formed in the cutting loop during diathermy triggered the explosion of the existing gas accumulation (3).

With *in vitro* experiments, Ning et al. (1) has shown that basically 40-50% of hydrogen is released during electrocautery. It has been proved that the contact of the exposed hydrogen with the outer oxygen reveals the explosive potential (4). Hansen and Iversen (5) showed that in *in vitro* and *in vivo* TURP processes, 65% hydrogen, 19% oxygen and to other residual

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hydrocarbons (methane, ethylene, ethane, propylene, propane and butane) were released, and the mixture with the outdoor air increased the probability of explosion. We emphasized that the operation time is parallel to the explosion probability of the accumulated gas (5). Viville et al. (6) also emphasized that the risk is higher in the use of continuous current resectoscope and in surgeries using high energy.

As mentioned in the previous studies, exploration and bladder repair was performed immediately in most cases with open surgery. Just in two cases, laparoscopic surgery was preferred (2). There was no significant difference in the outcome between the two approaches (2).

Conclusion

Various degrees of bladder injuries can be encountered in all TURP surgeries.

In TURP surgery, it is important to keep the operation time short, not to allow gas accumulation inside the bladder as much as possible, to pay attention not to give air into the bladder during the use of evaporator and to avoid high energy.

Observing the above rules in operating practice may decrease the likelihood of complications. Even though, it is critical for the urologists to be careful about the explosion sounds and be aware of the possible complications.

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Ethics

Informed Consent: Retrospective study.

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