

# Laparoscopic Repair of a Rare Case of Bladder Rupture Due To Intravesical Explosion during Transurethral Resection of the Prostate

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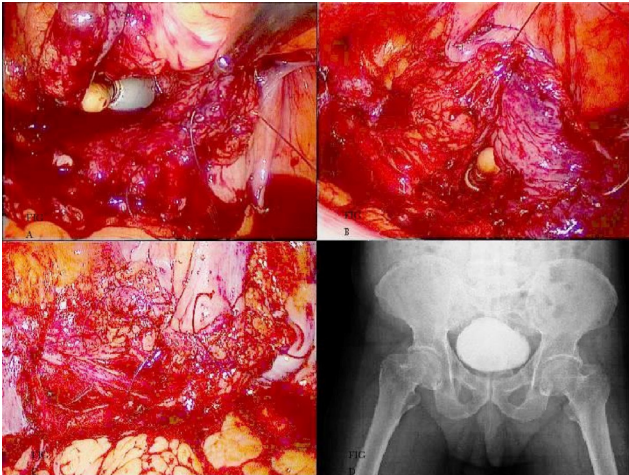
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## INTRODUCTION

Intravesical explosion is an extremely rare event during TURP.<sup>(1)</sup> Though previously reported, all the cases were dealt by immediate laparotomy and bladder repair.<sup>(1)</sup> To our knowledge this is the first case where laparoscopy has been offered as a treatment option.

## CASE REPORT

A 72 years old man presented with refractory urinary retention. The ultrasound evaluation showed 65 grams prostate, bladder was normal. All other preoperative parameters were within normal limits. The patient was administered a spinal anesthesia. Transurethral resection of the prostate (TURP) was performed using electrocautery (ERBE USA Inc., Marietta, GA, USA) at 75 watts cutting and coagulation current, a 26 French (F) resectoscope (Karl Storz GmbH & Co. KG, Tuttlingen, Germany) and sterile water was used as an irrigant. Initial 55 minutes of the procedure were uneventful, while resecting the lateral lobes of the prostate a loud snap was heard. Subsequent to that intestinal loops were seen in the bladder. TURP was immediately aborted. Foley catheter was inserted. The patient was intubated and converted to general anesthesia. Pneumoperitoneum was initiated using Veress needle, a 10 mm supraumbilical port was placed. Two 5 mm ports were placed radially on both sides at about 10 cm distance. Another 5 mm port was placed midway between the pubic symphysis and the midline 10 mm port. The



**Figure .** Photographs demonstrating; A: ruptured bladder with Foley catheter visible through the rent; B: partially sutured bladder; C: bladder filled with Methylene blue to check the integrity of bladder wall and D: post-operative cystogram showing well healed bladder.

extravasated irrigant and prostate chips were suctioned out. Then patient position was switched to Trendelenburg position, to allow the bowels to gravitate away from the field. There was a large laceration at the dome adjoining the posterior wall and Foley catheter was easily visible through the rent (Figure, A). A small portion of the unhealthy bladder was excised and the rest of the bladder was sutured with continuous 2.0 Vicryl suture (Polyglycolic acid suture; Ethicon, Inc, Somerville, New Jersey, USA) (Figure, B). This was reinforced with few interrupted sutures (Figure, C). At the end of the procedure the integrity of the bladder was confirmed using methylene blue instilled in the bladder and a 22F three way Foley catheter was placed. A peritoneal drain was left behind which was removed after 48 hours. The patient was discharged the 4th postoperative day. A cystogram was performed on the 14th day before catheter removal (Figure, D). Patient had a successful voiding following that. The histopathology of the prostate was benign prostatic hyperplasia and unhealthy segment of bladder excised was found to be normal.

## DISCUSSION

Traditionally bladder repair subsequent to intravesical explosion has been dealt with open surgery.<sup>(1)</sup> Laparoscopy avoids the big incision, pain and subsequent wound com-

plications associated with open surgery. With laparoscopy it is possible to remove the fluid accumulated in the abdomen more efficiently, especially in subphrenic, perisplenic and interbowel areas. Under high definition magnification it is very easy to deliver out the prostatic chips dispersed in the abdomen. Laparoscopy also offers an option for achieving hemostasis in the prostatic fossa as it offers good access deep into the pelvis.

The incriminating factor for intravesical explosion is the formation of explosive gases in the bladder during TURP and its admixture with air or oxygen.<sup>(1)</sup> The explosive gases when combined with air triggers explosion when it comes in contact with the resectoscope loop.<sup>(2)</sup> Hydrogen constitutes about 40 to 50% of gas which emits from the cautery followed by oxygen (3%).<sup>(3)</sup> According to them the majority of hydrogen was derived from the electrolysis of intracellular water. Davis and colleagues reproduced similar results in in vitro experiments.<sup>(2)</sup>

The best method to avoid this dreaded complication is to take precautionary measures. In patients with diseased bladder due to radiation, cystitis, tuberculosis and etc., extra caution is to be taken to avoid hyper distension. A continuous flow resectoscope would decrease the chances of over distension of the bladder and avoid air bubble entering the bladder by reducing the frequency of manual irrigation. Extreme caution should be exercised to avoid activation of the loop within the air bubble. Precise use of the Ellick's evacuator bulb, reducing the frequency of manual irrigations of the bladder would help prevent.<sup>(4)</sup> While resecting near the dome air may be aspirated using a ureteral catheter or a suprapubic catheter. Suprapubic pressure can be used to dislodge the air bubble away from the area of resection. Constantly changing the position during resection will also dislodge the air bubble.<sup>(5)</sup> Other preventive measures that have been recommended include decreasing the duration of resection with judicious coagulating of tissue, avoiding a high-temperature cautery during TURP, decreasing the mean time of resection. Newer technologies like bipolar resection and advanced electro cautery machines might reduce the incidence intravesical explosion.

## CONFLICT OF INTEREST

None declared.

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