Bladder Perforation From Capsaicin Infusion : A Case Report

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Abstract : We reported a 36 year old patient, with a spinal cord lesion who had bladder perforation during an infusion of 400 mls of Capsaicin (1mMol in 30% alcohol) for treatment of detrusor hyperreflexia. Under spinal anesthesia during the procedure he was restless and complained of chest discomfort. The operation was therefore terminated and a cystogram was carried out. Cystography showed extraperitoneal leakage of contrast media. He was treated conservatively and had an uneventful post-operative period. To prevent this complication, we therefore recommend an infusion volume of Capsaicin of between half to two-thirds of the patients' bladder capacity together with pressure monitoring during the procedure.

เรื่องย่อ : กระเพาะปัสสาวะทะลุจากการใส่ Capsaicin : รายงานผู้ป่วย

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รายงานผู้ป่วยชายไทย อายุ 36 ปี ที่มีพยาธิสภาพของกระดูกไขสันหลังซึ่งเข้ารับการใส่ยา Capsaicin เพื่อรักษาภาวะกระเพาะปัสสาวะไวเกินเรื้อรัง ระหว่างการรักษาภายใต้การให้ยาระงับความเจ็บปวดทางช่องไขสันหลัง ผู้ป่วยเกิดอาการแน่นท้องน้อย และหายใจไม่ค่อยออกอย่างทันทีทันใด จึงหยุดการใส่ยาดังกล่าว การตรวจทางรังสีพบว่ามีกระเพาะปัสสาวะทะลุ ซึ่งสามารถรักษาได้โดยการใส่สายสวนกระเพาะปัสสาวะ

เพื่อที่จะป้องกันมิให้เกิดภาวะดังกล่าว การใส่ยา Capsaicin ในผู้ป่วยที่มีพยาธิสภาพจากกระดูกไขสันหลังนั้น ควรวัดความดันในกระเพาะปัสสาวะเพื่อไม่ให้สูงจนเกินไป และปริมาณของยาควรจะอยู่ระหว่างครึ่งหนึ่งถึงสองในสามของความจุของกระเพาะปัสสาวะที่ได้ตามผลการตรวจทางยูโรพลศาสตร์

INTRODUCTION

Intravesical Capsaicin has been used in management of patients with detrusor hyperreflexia for many years. However, there is no real consensus in terms of doses, duration of treatment, frequency and monitoring during Capsaicin instillation[1,2,3]. There is no major complications by intravesical Capsaicin reported. Only minimal systemic absorption was observed and it was well tolerated by most patients[1]. In our experience at Siriraj Hospital, most of our patient has had burning sensation during instillation therefore anesthesia is recommended[4]. From

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literature searching there is no report of bladder perforation during Capsaicin instillation. We now report the first case of this major complication.

CASE REPORT

A 36 year old company clerk presented to us with symptoms of incontinence which had been present for more than 3 years. Three years previously he had experienced a motorcycle accident, sustaining a fracture and dislocation of T12 to L1 which required spinal stabilisation with interspinous wiring and a Harrington Rod. He can walk with a crutch. He had been catheterised since the operation without any success of a trial without catheter. Each time the catheter was removed he was incontinent. Therefore he was put on long term catheterisation. He had been investigated with cystometry, which showed an evidence of detrusor hyper-reflexia and small bladder capacity. His cystogram also demonstrated a Christmas tree appearance and small bladder capacity without any reflux of urine to the ureters and kidneys on either side. This was consistent with his previous spinal injury. Three months previously he had been admitted for 200 mls of Capsaicin instillation, but his symptoms had not improved significantly following this first instillation. This time he was admitted for a trial of repeated Capsaicin instillation at a higher volume. He can maintain a good erection and has ejaculation. He denies other significant past medical history. On examination he had lost his peri-anal sensation, however his bulbocarvernosus reflex was still intact. He had also lost his pain and propioceptive sensation from L4 downwards on both sides. His muscle power was also decreased particularly in the abduction and extension groups of his hip bilaterally. Extension and flexion movements of his knees were weak. He could not move his ankles including his toes. Investigations showed a normal complete blood count examination, urine analysis, and blood chemistry. Ultrasound of his kidneys showed no significant abnormality. Cystometry prior to the first instillation revealed a bladder capacity of only 149 mls with significant detrusor contraction during the filling phase (Figure 1). A repeat study after the first instillation showed an increased in bladder capacity but no change in detrusor pressure of an instability contraction. Under spinal anesthesia he underwent an infusion of 400 mls of capsaicin (1 mMol in 30% alcohol) instillation via a urethral catheter. Ten minutes later the patient was restless and complained of chest discomfort. His heart rate dropped down to 40 beats/minute and he was also hypotensive (90/60 mmHg). 0.6 mg of atropine was given. He was then intubated. The Capsaicin infusion was stopped and removed from his bladder. Only 200 mls of infusated fluid was withdrawn and it was bloody in colour. The operation was therefore terminated. In the recovery room the patient was restless complaining of abdominal pain and his abdomen was distended. His urethral catheter was blocked with blood clots. Bladder perforation was suspected and he was brought back to the operating theatre. Cystoscopy was performed. There was 500 mls of blood clot inside his bladder. The bladder mucosa was very inflammed, trabeculated and generalised bleeding was found. There was a perforation area apparent at the posterior wall above the trigone. Cystography confirmed evidence of extraperitoneal leakage (Figure 2-4). During post operative period the patient developed a low grade temperature and peritonism. He was treated conservatively. His abdominal signs improved and his bowels function recovered within 4 days. He was completely recovered on the ninth day after the operation. Bladder biopsy confirmed acute inflamation and mucosal congestion.

The patient urinary symptoms were not improved from this failed procedure he is now awaiting for an augmentation cystoplasty operation.

DISCUSSION

Capsaicin is a derivative of vanillyl amide, 8-methyl-N-vanillyl-6-nonenamide and has molecular weight of 305.42. It is a substance found in a hot red chilli pepper. At high concentration it can be directly neurotoxic to a nonmyelinated C fibre transmitting noxiceptive information from the periphery to the spinal cord. Capsaicin has been reported to be useful in the treatment of detrusor hyperreflexia and detrusor instability[4,5,6]. It is also beneficial in patients with loin pain hematuria syndrome[7]. Claire Flower reported the results of treatment of intravesi-

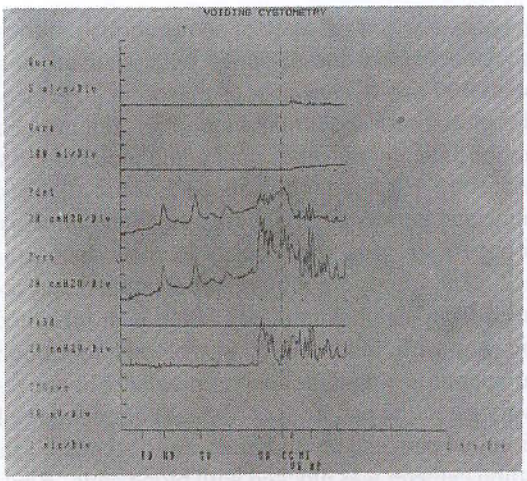

Figure 1. Cystometry showing detrusor contractions during filling phase.

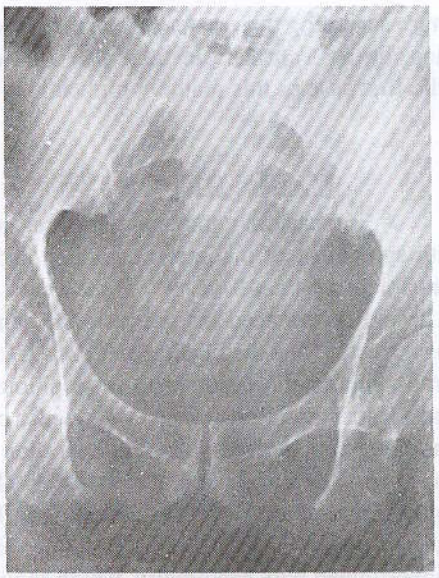

Figure 2. KUB x-ray film before cystography illustrated no contrast media.

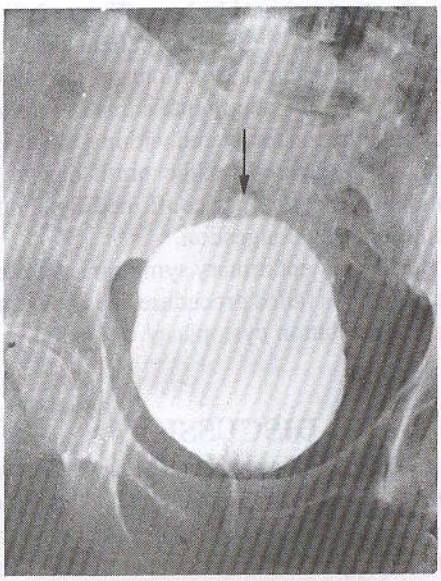

Figure 3. Cystography showed contrast media leaking at the dome of the bladder.

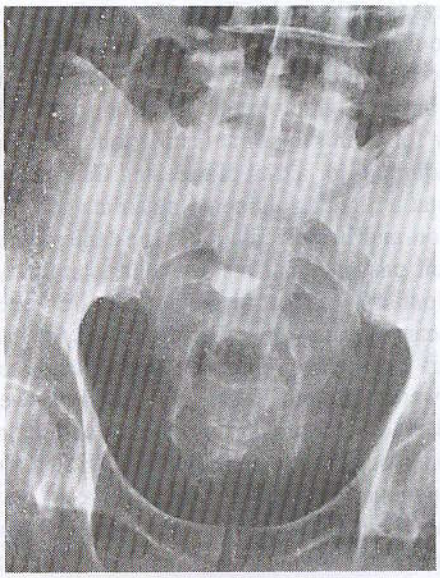

Figure 4. KUB x-ray film post evacuation showed contrast media left in the pelvic cavity.

cal capsaicin as a treatment for refractory detrusor hyperreflexia. Overall 80% of patients achieved some clinical benefit. 36% of patients had decreased episodes of urge incontinence. This was confirmed by urodynamic findings. Furthermore, there was no evidence of dysplasia or carcinoma in this group of patients[8]. Capsaicin is a selective neurotoxin for small unmyelated C fibres, which are responsible for sacral spinal reflex in patients with spinal injuries. Therefore the rationale for intravesical instillation with Capsaicin in patients with detrusor hyperreflexia and spinal cord pathology is based on this principle[9,10,11,12].

There is no real consensus regarding Capsaicin dose, concentration on amount to be instilled. In patients with spinal cord pathology associated with detrusor hyperreflexia the bladder capacity tends to be smaller than usual. They also have a trabeculated bladder and/or multiple bladder diverticulae. These two factors may make bladder perforation easier when high volumes of fluid are instilled.

This is the first known report of bladder perforation after Capsaicin instillation in a patient with spinal cord injury. The patient developed bladder perforation following Capsaicin instillation. In this patient we used 1 mMol of capsaicin in a volume of 400 mls as recommended by Fowler *et al*[1]. This amount of instillated fluid was higher than the patient's bladder capacity. This high volume and a presence of bladder diverticulae may have contributed to the bladder perforation.

There is no need for a high volume to be used during Capsaicin instillation. This is due to the fact that there is an evidence of vesicorenal reflex inducing diuresis during Capsaicin instillation[13] and the mechanism of action depends upon the attachment of Capsaicin molecule onto vanilliod receptor on cell membrane of bladder mucosa[14]. Therefore we recommend that a volume of half to two-thirds of the bladder capacity should be used when Capsaicin instillation is used for treatment of detrusor hyperreflexia in patients with spinal injury. Furthermore the intravesical pressure should be monitored during the procedure. An acceptable pressure should be less than 40 cmH2O to prevent reflux of Capsaicin into ureters and kidneys. Capsaicin has been found to destroy kidney during ureteral infusion in the treatment of loin pain hematuria syndrome[7]. An instillation at low pressure and low volume can not are prevent kidney damage from reflux but also prevent autonomic dysreflexia that may occur in patients with high spinal cord lesion.

CONCLUSION

Capsaicin is effective in the treatment for an over-active bladder caused by suprasacral cord lesion and detrusor instability. In patients with a spinal cord lesion Capsaicin infusion should be used under general anesthesia to prevent autonomic dysreflexia. During Capsaicin infusion the bladder pressure should be monitored and the volume of Capsaicin solution should be limited to two-thirds of bladder capacity to prevent the bladder perforation.

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