CLINICAL CASE

Multimodal management of bladder cancer associated with bladder perforation during transurethral resection


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KEYWORDS
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Abstract Transurethral resection of the bladder (TURB) is a first-line diagnostic and therapeutic procedure. Bladder perforation is an infrequent complication that requires open repair when it is intraperitoneal, increasing the risk for pelvic or distance recurrence.

A 32-year-old man presented with total gross hematuria and acute urine retention. A computerized axial tomography (CAT) scan showed an 8 cm bladder tumor occupying 80% of the lumen. TURB was performed reporting T1G3 high-grade urothelial neoplasia with residual tumor. The patient was reoperated on for persistent hematuria, and presented with detected intraperitoneal bladder perforation. Laparotomy with 2-layer closure was carried out. The patient received neoadjuvant chemotherapy with paclitaxel and carboplatin and a CAT scan showed a tumor reduction of 60%. Two months later, a radical cystoprostatectomy with a continent orthotopic diversion was performed. Low-grade urothelial papillary carcinoma with no peritoneal implants was reported. Presently, at 8 months, the patient has no disease progression or recurrence.

Open repair of bladder perforation has been associated with 100% extravesical recurrence at 7.5 months. The use of neoadjuvant chemotherapy has demonstrated a 5% improvement in overall survival and 9% disease-free status at 5 years, reducing the risk for intraperitoneal spread after bladder perforation.

Chemotherapy neoadjuvant to radical cystoprostatectomy can be an alternative for the treatment of bladder tumors after perforation during TURB.
Introduction

Bladder cancer is the second most frequent tumor of the genitourinary tract. Transurethral resection of the bladder (TURB) is a first line diagnostic and therapeutic procedure in bladder tumors. Its combination with chemotherapy or immunotherapy is standard management for superficial bladder tumors. The complication most frequently associated with this procedure is intra and postoperative bleeding (2%-13%), followed by extra or intraperitoneal bladder perforation (1.3%-5%). Extraperitoneal perforation presents in the majority of cases (> 80%) and only requires transurethral catheter placement to resolve the symptoms. Nevertheless, the majority of intraperitoneal cases require open repair. There is evidence suggesting that after this type of repair the risk for pelvic or distant recurrence increases, advancing to at least stage T3 and inducing perivesical and peritoneal seeding in addition to increasing morbidity and mortality1,2; however, the studies regarding this phenomenon have a suboptimal evidence level.

Case presentation

A 32-year-old man with a history of moderate smoking (smoking index 3.5) had disease onset presenting with total gross hematuria with amorphous coagulates that led to acute urinary retention. Study protocol began with a computerized axial tomography (CAT) scan that identified an 8 cm bladder tumor, dependent on the right posterolateral wall and taking up 80% of the lumen (fig. 1), with positive high-grade urothelial tumor cytology, with no evidence of metastatic disease. TURB was carried out on the irregular and wide-based tumor that occupied 80% of the bladder lumen. Bimanual palpation was negative for deep layer fixation and the tumor was resected. Radical cystoprostatectomy was completed, and with a 24-hour creatinine depuration of 130 ml/min, radical cystoprostatectomy with a continent orthotopic diversion was performed (fig. 2). There was no evidence of peritoneal implants in other intraperitoneal organs. The final histopathologic report was stage T1G1 low-grade urothelial papillary carcinoma measuring 4 x 3 cm, with negative lymph nodes (fig. 3). The postoperative period had no complications and the patient was released on the twentieth day, presenting with adequate spontaneous urinesis and good control of the sphincter one month after the surgery. The patient has shown no evidence of disease progression or recurrence and has adequate urinary function at the eighth month of oncologic follow-up.

Discussion

Open repair of bladder perforation has been associated with 100% extravesical recurrence at 7.5 months, especially if the tumor is larger than 3 cm, the perforation is intraperitoneal, or surgery is required for its repair. In a review of 3,410 cases of bladder tumors managed with TURB, there is evidence suggesting that after this type of repair the risk for pelvic or distant recurrence increases, advancing to at least stage T3 and inducing perivesical and peritoneal seeding in addition to increasing morbidity and mortality1,2; however, the studies regarding this phenomenon have a suboptimal evidence level.

Manejo multimodal del cáncer vesical asociado a perforación de vejiga durante la resección transuretral

Resumen La resección transuretral de vejiga (RTU) es un procedimiento diagnóstico y terapéutico de primera línea. La perforación vesical es una complicación infrecuente que requiere reparación abierta cuando es intraperitoneal, lo que incrementa el riesgo de recurrencia pélvica o a distancia. Se presenta paciente masculino de 32 años de edad, con hematuria macroscópica total y retención aguda de orina. Tumor vesical de 8 cm, del 80% de la luz por tomografía axial computarizada (TAC); RTU con neoplasia urotelial de alto grado T1G3, con tumor residual. Se realiza reintervención por hematuria persistente, presentando perforación intraperitoneal vesical advertida, realizando laparotomía con cierre en 2 planos. Se dio quimioterapia neoadyuvante con paclitaxel y carboplatin, observando reducción del tumor de 60% por TAC. A 2 meses se realizó cistoprostatectomía radical con derivación ortotópica continente, con reporte de carcinoma papilar urotelial de bajo grado, sin implantes peritoneales. Actualmente, sin progresión o recurrencia por 8 meses. La reparación abierta de la perforación vesical se ha asociado a recurrencia extravesical del 100%, a 7.5 meses. El uso de quimioterapia neoadyuvante ha demostrado mejora en la sobrevida global del 5%, y sobrevida libre de enfermedad del 9% a 5 años, disminuyendo el riesgo de siembra intraperitoneal tras perforación vesical. La quimioterapia neoadyuvante a la cistoprostatectomía radical, puede representar una alternativa para tratamiento de tumores vesicales tras perforación durante la RTU.
Skolarikos et al. identified 34 cases of both intra and extraperitoneal perforation (5 and 29 cases, respectively). Only 4 of those cases were managed with open repair, showing statistically significant differences in relation to recurrence and outcome in patients requiring surgery for repair \((p<0.001)\), as well as those that presented with intraperitoneal perforation \((p=0.0003)\) and with tumor size > 3 cm \((p=0.01)\). On the other hand, there are studies that have demonstrated that bladder perforation with open repair does not increase the risk for extravesical tumor seeding, although it does increase morbidity and contraindicates the use of intravesical chemotherapy in cases of non-muscle-invading tumors\(^3\). In a review of 4,144 patients that underwent TURB, Golan et al. found that 15 patients required open repair due to perforation; it was intraperitoneal and the posterior wall was the most frequently affected in 12 of those patients. Tumor residual was left in 7 patients; and 2 patients presented with disease progression at a mean of 4.8 months and an estimated disease-free survival rate of 83\%, 71\%, and 41\% at 1, 3, and 5 years, respectively. A bladder perforation incidence of 58\% was detected through postoperative cystograms, and advanced age patients, those with large tumors of the posterior wall, and patients with previously treated bladders were the most prone to present with perforation\(^2\). In another study, Herkommer et al. evaluated 1,284 cases of patients that underwent TURB and identified women, obesity, and tumor characteristics (invasive tumors and a weight above 20 g, resected in the procedure) as risk factors for perforation\(^4\,^5\). Early cystectomy can be done on patients with high-grade non-muscle-invading tumors, in patients in whom intravesical chemotherapy is contraindicated, or that have extensive papillary tumors that are not able to be resected through endoscopy; likewise, it can be indicated when there is a high risk for disease recurrence and progression\(^6\).

Neoadjuvant chemotherapy with 2 or 3 cycles can be carried out in different combinations: gemcitabine + cisplatin and MVAC (methotrexate, vinblastine, doxorubicin, and cisplatin) as first line regimens; and as an alternative,
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carboplatin can be combined with taxanes (paclitaxel, docetaxel), achieving responses of up to 58% to 80% with adequate tolerance7,8. The use of neoadjuvant chemotherapy has demonstrated a 5% improvement in overall survival and a 9% improvement in disease-free survival at 5 years, with the possibility of treating micro-metastatic and occult lymph node disease, as well as reducing tumor size, to later perform cystectomy and reduce the risk for intraperitoneal seeding after bladder perforation during TURB9. Our case was a young patient with a large, high-grade tumor that required aggressive multimodal management in order to provide him with a better quality of life in the face of the high disease recurrence and progression rates that can present.

Conclusions
Chemotherapy as a neoadjuvant to radical cystoprostatectomy can be used as an alternative, providing better surgical management, reducing tumor size, and facilitating bladder dissection. In addition, it is useful for treating bladder tumors after perforation during TURB. Because perforation is not a frequent occurrence during TURB, there are no guidelines or protocols established for managing these complications, which is why reports on this type of incident are necessary so that norms of conduct can be established.

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Conflict of interest
The authors declare that there is no conflict of interest.

References