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Partial Cystectomy for Invasive Bladder Cancer

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Abstract

Background: Radical cystectomy with pelvic lymph node dissection is the standard treatment for patients with invasive bladder cancer. However, many alternative techniques to spare the bladder have been investigated. Single-center, non-randomized studies have reported good patient's acceptance and reasonably good treatment outcomes.

Methods: We review the experience reported in the literature on bladder-sparing techniques, including transurethral resection, chemotherapy, radiation, and multimodality approaches for muscle-invasive disease focussing on controlled clinical trials.

Results: Most comparative studies indicate that local recurrence and survival outcomes for bladder-sparing approaches are inferior to those from radical cystectomy to control muscle-invasive bladder cancer.

Conclusions: Although molecular biologic techniques may have the capacity to identify a subgroup of patients who may benefit from a bladder-sparing approach, cystectomy is normally required for optimal results. Nevertheless, several alternatives to radical cystectomy for muscle-invasive bladder cancer have been studied. None, however, are reliably superior to radical operative treatment.

Keywords: Organ-sparing treatment; Partial cystectomy; Invasive bladder cancer; Review; Clinical trials

1. Introduction

The standard treatment of invasive bladder cancer has been radical cystectomy with pelvic lymph node dissection (PLND). Radiation therapy has been reserved primarily for patients who are unfit for cystectomy based on age, comorbidity, and extent of disease [1].

A major advancement in the treatment of invasive bladder cancer occurred with the advent of effective chemotherapy with the M-VAC protocol and others such as gemcitabine and cisplatin. A complete response rate of 25% and a partial response rate of 48% has been observed with these regimens. However, the role of systemic chemotherapy, as either an adjuvant or a neoadjuvant treatment, continues to evolve, and its impact on survival remains investigational [2]. Many alternative treatments to radical cystectomy, alone or in combination, have been tried [3,4].

We review the alternatives to radical cystectomy for muscle-invasive bladder cancer in terms of organ preservation and survival, and we compare these results with the most recent data on radical cystectomy.

2. Transurethral resection

Transurethral resection (TUR) is used primarily in muscle-invasive bladder cancer to establish the diagnosis and local extent of the disease. The use of TUR for definitive treatment of muscle-invasive bladder cancer is predicated on tumor volume, multifocality, and associated carcinoma in situ (CIS). Understaging of the depth of tumor involvement occurs in up to 40% of cases. Nevertheless, several series have shown that TUR provides disease control, particularly in patients with lower clinical disease stages [3,4].

In a prospective study, Solsona et al. [5] reported on 133 candidates for conservative treatment. The inclusion criteria for this group were histological confirmation of muscular infiltration, endoscopic radical TUR, disappearance of hardened areas on the bladder wall after resection on bimanual examination, and negative

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biopsies of the depth and periphery of the tumor bed. The control group consisted of 76 patients with invasive pathologic stage pT2–3a, N0–3 bladder cancer treated with cystectomy and followed for more than 5 years. After 5 years, 61 patients (45.9%) in the TUR group relapsed, 35 (26.3%) had disease recurrence, and 37 (27.8%) had disease progression. Of the original 133 patients, 59 were followed for a median of 10 years, and there was no significant statistical difference in survival in the two groups vs. the control group. At 5 and 10 years, the cause-specific survival rates were 80.5% and 79.5% and bladder preservation rates were 82.7% and 79.0%, respectively, in each group. This was not a randomized study; selection bias toward cystectomy and TUR could be present. Evidence of CIS was the only significant statistical variable to predict progression. Other series in the literature present overall survival from 31–68% as follows: stage T2 at 57–70%, stage T3a at 14–57%, and stage T3b at 2–7% [6]. In the publication of Solsona et al. [5] overall survival was reported at 83%. A recent series by Memorial Sloan-Kettering evaluated 170 consecutive patients who underwent secondary TUR for bladder tumors by a referring physician [6]. A total of 150 patients had repeat TUR, with 114 (76%) having residual tumor on repeat TUR. In patients with superficial (Ta, Tis, T1) bladder tumors, 72 (75%) had residual tumor and 28 (29%) were upstaged to muscle invasive disease. Only 12 (22%) of patients with an initial T2 pathologic stage had no residual tumor with repeat TUR. These data stress the importance of a repeat TUR on patients considered for bladder-sparing protocols and suggest that bladder preservation be used in controlled protocol studies and not as a standard treatment.

Recent data show only a 9% incidence of nodal metastasis in patients with pathologic stage T2 on radical cystectomy specimen compared with 37% of pathologic stage T3 patients [1]. This suggests that a tumor amenable to complete resection by TUR will have a low incidence of nodal metastasis. We can conclude that patients with completely resected tumor may not need to undergo a cystectomy. As suggested by the literature reviewed above, the ideal candidate for radical TUR has a primary, solitary, or papillary tumor that is 3 cm or less in size, and the patient must be amenable to follow-up [5,6].

3. Partial cystectomy

Partial cystectomy is not a commonly used technique by the urologist and remains an incompletely evaluated surgical option in the treatment of bladder cancer [7]. Partial cystectomy permits complete pathologic staging of the tumor and pelvic lymph nodes while preserving bladder and sexual functions. No randomised trials have been conducted to compare this surgical treatment, by stage, with other treatment modalities. Partial cystectomy as a treatment for muscle-invasive bladder cancer may be considered in patients with a tumor that is primary, solitary, and amenable to removal with 2 cm surgical margins. A biopsy must be performed on the remaining urothelium to ensure that it is normal [8]. Several publications of retrospective series, with the above criteria as well as less restrictive, resulted in the use of partial cystectomy in 5.8–18.9% of all patients undergoing cystectomy for bladder cancer [8,9]. These studies show a 5-year overall survival rate of approximately 25–60%, with local overall and recurrence rates ranging from 40–78%. The recurrence rates according to stage were as follows: stage T2 was 29–80%, stage T3 was 7–33%, and stage T4 was 0–20%. As with any bladder preservation technique, appropriate patient selection is important to achieve adequate survival rates. The suboptimal survival observed in many series of partial cystectomy may be attributed to loosely interpreted inclusion criteria. At the time of partial cystectomy, a frozen section is necessary for evaluation of the margins by a uropathologist [3,4,8].

4. Radiation therapy

External-beam radiation therapy (EBRT) is the primary treatment for invasive bladder cancer in some countries. Most commonly, EBRT appears inferior to cystectomy and thus is rarely recommended as a primary treatment [1]. Several trials of primary radiation therapy in patients with clinical stage T2 disease show an overall 5-year survival rate of 40%, with a local control rate of 40–50%. Distant metastasis developed in 10% of the patients. For clinical stage T3 disease, the 5-year survival rate of these patients is approximately 20%, and the local recurrence rate ranges from 50–70%. For clinical stage T4 disease, the 5-year survival rate is 10% [10]. Selection criteria for primary radiotherapy include papillary tumors, complete TUR prior to radiotherapy, tumor size less than 5 cm, and low-stage tumors. Holmang et al. [10] reported a series of 74 patients treated with radical radiotherapy for bladder cancer. Following treatment, 84% of these patients had persistent tumor, a local recurrence, or a contracted bladder. The medial survival for stages T2 and T3 was 16 months, with a high