7 Laparoscopic Retroperitoneal Lymph Node Dissection for Testicular Tumors

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Introduction

Testicular cancer, although relatively rare, is the most common malignancy in men in the 15- to 35-year age group and evokes widespread interest for several reasons. The combination of effective diagnostic techniques, improved tumor markers, effective multidrug chemotherapeutic regimens, and the modifications of surgical technique has led to a dramatic improvement in patient management and a decrease in patient mortality from more than 50% before 1970 to less than 5% in 1997 [1].

The fact that testicular cancer spreads in a predictable and stepwise fashion, with the notable exception of choriocarcinoma is the basis of its modern surgical treatment principles.

Staging is considered the first step in the management of testicular cancer patients; after radical orchiectomy. A convenient division for staging systems is those patients with seminomas and those with nonseminomatous tumors. Patients with pure seminoma are usually staged by clinical means, whereas staging in patients with nonseminomatous germ cell tumors (NSGCTs) sometimes employs surgical techniques such as retroperitoneal lymph node dissection (RPLND) as well. The extent of staging is determined in part by decisions for therapy; for example, if surveillance protocols are to be considered, every effort should be made to exclude patients with any evidence of retroperitoneal disease. If retroperitoneal lymphadenectomy is likely to be elected as the primary treatment for low-stage, nonseminomatous tumors, efforts should be directed toward delineation of regional and nodal vs distant metastases.

Indications

Nonseminomatous Germ Cell Tumors

Clinical Stage I

To date, three treatment options are available and considered by urologists for the management clinical stage I nonseminomatous testicular cancer: surveillance, risk-adapted chemotherapy and retroperitoneal lymph node dissection.

Of patients with clinical stage I disease, 25%–30% have occult lymph node metastases, which cannot be diagnosed by the most sensitive imaging techniques available [2, 3]. This group of patients will be victimized if surveillance strategy is followed, as they will be diagnosed later after the tumor has substantially increased in size, thereby requiring a higher dose of
chemotherapy for treatment. Furthermore, as the patient’s compliance is usually not perfect, some tumor-bearing patients might be lost during follow-up. Surveillance without prior lymph node dissection has a relapse rate of 19%-40% [4-6] vs 5%-10% for pathological stage I testicular cancer after retroperitoneal lymph node dissection [7-10]. Moreover, the most serious drawback of surveillance is not only the high relapse rate but the associated death rate of approximately 10% among those patients who do relapse [3].

The primary advantage of surveillance was the avoidance of retroperitoneal lymph node dissection and its attendant morbidity, as before the introduction of modified unilateral dissection and nerve-sparing techniques, the majority of patients suffered ejaculatory disturbances with resultant loss of fertility [11].

Recently risk-adapted chemotherapy has been introduced as a measure to overcome the above-mentioned problems [12]. However, there is no general consensus about risk factors and their clinical relevance, except for vascular invasion and embryonal carcinoma [13]. We have performed a retrospective analysis on 88 consecutive patients undergoing RPLND. Because the definition of risk factors varies greatly, the patients were evaluated using a highly specific risk factor (70% or more embryonal carcinoma together with vascular invasion) as an example of the many possibilities of calculating the risk. Even though the risk factor used was specific (present in 25% of the patients), 52% of patients who would have been considered candidates for chemotherapy did not have retroperitoneal tumors. On the other hand, 50% of patients with retroperitoneal tumors would have been considered low risk and left without treatment. Another staging study has also shown that 20% of patients with suspicious findings on CT actually have pathologic stage I disease [14], and therefore might suffer the side effects of adjuvant chemotherapy: the acute ones (nausea, mucositis and nadir sepsis) as well as the long-term more morbid ones (pulmonary fibrosis and impaired spermatogenesis) [15, 16], in vain.

RPLND is the only reliable method permitting the verification of small positive lymph nodes and the exclusion of false-negative ones. However, the morbidity of open RPLND is too high for a diagnostic procedure: the short-term morbidity of major intra-abdominal surgery and the long-term ones, which is much less tolerated, including loss of antegrade ejaculation and a life-long scar that impairs the quality of life of a usually young patient.

Since knowledge of the definite lymph node status is a prerequisite for adequate stage-adapted treatment, RPLND is retained as a diagnostic and in a way therapeutic tool, but, at the same time, its morbidity is substantially reduced by the use of laparoscopy.

Our recent data, as well as data of other centers, show that laparoscopy shares the same efficacy of open RPLND. Relapse rates after open RPLND alone are as high as 8%-29% for stage IIa tumors [17, 18] and 34%-55% for stage IIb tumors [18, 19]. This rate falls to as low as 0%-1% if two cycles of adjuvant chemotherapy are given [19, 20]. Laparoscopic RPLND, therefore, reduces the high morbidity of the combination of open RPLND and adjuvant chemotherapy in node positive patients.

Clinical Stage II

Neither retroperitoneal lymphadenectomy [17–19, 21] nor chemotherapy [22, 23] can be expected alone to be curative in all patients in this stage. A combination of both is expected to achieve the most effective results. Most urologists prefer the strategy of primary chemotherapy followed by RPLND for residual masses. In this case, RPLND is performed in a diagnostic intent, i.e., to exclude that the residual mass contains active tumor, but sometimes can be curative, i.e., if mature teratoma is found and removed.

Again, the advantage of laparoscopy here rises by reducing the double morbidity of chemotherapy and open surgery. In an attempt to further reduce the morbidity of this combined treatment, we have reduced the dose of chemotherapy to two cycles for stage IIb, which is obviously the minimum dose required for complete tumor control [24]. However, this approach is experimental at present, which makes the evaluation of the effect of chemotherapy by laparoscopic RPLND mandatory in each patient.

RPLND can be performed as a first step in a therapeutic intent. In this case, it has to be done bilaterally to remove not only the primary landing site but also all possible sites of tumor spread. By laparoscopy, bilateral RPLND is only feasible as a staged procedure, which decreases efficiency and increases morbidity. Other studies have found that laparoscopic RPLND should not be recommended for residual masses owing to the intense desmoplasia in the vicinity of the great vessels after chemotherapy [25], but our results have shown it to be technically feasible not only in stage IIb, but also IIc. However, in the latter stage, the