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Original contribution

Total submission of lymphadenectomy tissues removed during radical prostatectomy for prostate cancer: possible clinical significance of large-format histology☆,☆☆,★

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Summary Complete submission of lymphadenectomy specimens increases the number of recovered lymph nodes and the detection of metastatic disease. There are advantages with the whole-mount technique over complete sampling with standard cassettes in terms of time needed to sample the tissue, number of blocks to be cut, and slides to be examined. The clinical significance of the approach is that all lymph nodes are identified, including those that are not palpable. In particular, this approach avoids the fact that an individual lymph node is oversampled and counted according to number of pieces obtained by the pathologist, mainly in nodes with considerable size.

1. Introduction

The recent article by Perry-Keene et al [1] entitled "Total submission of pelvic lymphadenectomy tissues removed during radical prostatectomy for prostate cancer increases lymph node yield and detection of micrometastases" examined 109 pelvic lymphadenectomies accompanying radical prostatectomy specimens to assess the benefit of complete submission of the lymph node packets, processed

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with standard histologic cassettes, to detect extra lymph nodes and metastatic disease. They found that submission of all pelvic lymphadenectomy tissue for histologic examination improves the yield of lymph nodes and the detection of metastatic prostate cancer.

The aim of this study is to report our experience on the whole-mount technique (ie, large-format histology) for the histologic examination of all pelvic lymphadenectomy tissue.

2. Materials and methods

We adopted the whole-mount technique for the histologic examination of all pelvic lymphadenectomy tissue. This was done in 9 cases (group 1) received from 1 of 5 urology services whose radical prostatectomy specimens, including their pelvic lymphadenectomy tissue, were examined by one of us and the main findings shared and discussed with the others of our groups. The main scope was to identify the pros and cons of the whole-mount technique for the complete histologic sampling of lymphadenectomy tissue. The secondary aim was to see whether the approach improves detection of metastatic prostate cancer. The procedure for this research project conforms to the provisions of the Declaration of Helsinki.

Comparison was done with 2 additional series of a similar number of cases examined with standard histologic cassettes, one whose pelvic lymphadenectomy tissue was entirely examined (group 2; 11 cases), and the other in which only palpable lymph nodes (group 3; 10 cases) were processed.

To avoid the influence on the results of the surgical technique, urologists performing the operation, and variations in amount of tissue removed and its location, we considered only the right side of the extended pelvic lymph node dissection performed by a single urologist with the open surgery technique. The anatomic limits of extended pelvic lymph node dissection includes 2 areas of lymphatic tissue: the first is the area between the external iliac vein and the obturator nerve, that is usually removed in a larger tissue pack (major tissue pack); the second area includes tissue below the obturator nerve and onto the internal iliac vessels, that is a small tissue pack (minor tissue pack) plus isolated adipose tissue including few lymph nodes.

For the purpose of this investigation, only specimens ranging in size from 6- to 8-cm by 4- to 5-cm, approximately 2-cm thick, were considered. All patients (mean age, 66 years old) had pT2c and pT3a acinar adenocarcinoma and Gleason score 3 + 3 = 6 and 3 + 4 = 7. None of the patients had received hormonal therapy before surgery. All patients had intermediate- or high-risk prostate cancer, according to National Comprehensive Cancer Network classification [2], based on preoperative prostate-specific antigen, biopsy Gleason score, and clinical staging.

The specimens were fixed for 24 hours then processed. Each specimen was sliced at an interval of 4 to 5 mm with a trimming knife. The cut specimen, already fixed for 24 hours in 4% neutral buffered formalin, was then dehydrated in graded alcohols, cleared in xylene, embedded in paraffin (the material was processed in the routine with large tissue cassette or megacassette [dimensions, 63 × 47 × 11 mm] together with standard cassettes ([dimensions, 30 × 25 × 4 mm]), and examined histologically as 5-μm-thick whole-mount hematoxylin and eosin (H&E)–stained sections. In group 1, suboptimal sections in terms of quality of fixation and tissue processing, with lymph node parenchyma still evaluable, were observed in one case, whereas a single block had to be serially sectioned to visualize the entire embedded tissue.

To avoid counting the same lymph node twice in separate slides, we adopted the following approach:

- lymph nodes with identical shape or size were counted as representing the 2 halves of one lymph node
- when in doubt, the 2 parts were considered as a single lymph node
- small lymphoid aggregates without a peripheral sinus and capsule were not considered as lymph nodes.

It was also based on the gross examination of the specimen, where a single node could be designated as such and correlated with the microscopic appearance.

3. Results

The characteristics of the specimens containing lymph nodes in the 3 groups are reported in the Table.

Table Characteristics of the specimens containing lymph nodes in the 3 study groups

	Group 1	Group 2	Group 3
No. of cases	9	11	10
No. of blocks/slides (median and range)	3 (2-4)	18 (10-24)	5 (3-10)
No. of lymph nodes (median and range)	11 (6-15)	10 (5-14)	4 (1-8)
Total no. of positive lymph nodes (micrometastasis)	2 (1)	2 (1)	1 (0)
Time needed to section each specimen (min)	5 (4-8)	15 (8-20)	10 (7-15)
Cutting time (min) (median and range)	10 (8-15)	30 (15-40)	8 (5-17)
Analysis time (min) (median and range)	6 (4-8)	25 (12-35)	7 (5-15)

NOTE. Group 1: complete sampling with whole-mount technique; group 2: complete sampling with standard cassettes; group 3: sampling of the palpable lymph nodes with standard cassettes.