

be determined.^{16,17} Although there is no agreement on the boundary of LND, previous studies demonstrated that 10% of single metastasis involved the common iliac nodes¹⁷ and nodal metastases in patients having multiple nodal metastases were found in common iliac and extrapelvic nodes such as paracaval, aortocaval and pataaortic nodes.¹⁸ Since preoperative assessment of nodal status is difficult even using modern imaging modalities, complete LND is necessary for accurate nodal staging of bladder cancer. In addition, the most effective therapy for metastatic nodes might be complete surgical dissection. Thus, it is mandatory to remove as many pelvic lymph nodes as possible for accurate staging, prognosis and radical treatment.

Conclusions

Removal of 13 or more lymph nodes has a significant impact on the disease-specific survival of node-positive patients. Adequate PLND provides accurate nodal staging and important pathological information for prognosis in node-positive patients.

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Table 1 Clinical and pathological stages and tumor histology

	No. of pts (%)
<i>Clinical stage</i>	
T1/Tis	5 (3.4)
T2	71 (48.6)
T3	43 (29.5)
T4	27 (18.5)
<i>Pathological stage</i>	
T0	19 (13.0)
T1/Tis	30 (20.6)
T2	41 (28.1)
T3	37 (25.3)
T4	19 (13.0)
<i>Histology</i>	
UC*	112 (76.7)
UC + other histological component	28 (19.2)
Other histological component	6 (4.1)

* UC; urothelial carcinoma

Table 2 Multivariate analysis of parameters predicting disease-specific survival in node-positive patients

parameter	Multivariate p-value	Hazard ratio	95% CI
histology (pure UC* vs. other histological component ± UC)	0.6897	1.279	0.382 – 4.279
grade (G1/G2 vs. G3)	0.4450	1.936	0.355 – 10.550
pathological stage (= T2 vs. T3 =)	0.0132	8.205	1.553 – 43.343
No. of removed nodes (= 13 vs. < 13)	0.0008	9.363	2.526 – 34.704
No. of positive nodes (< 4 vs. 4 =)	0.0115	4.944	1.431 – 17.085
adjuvant chemotherapy (with vs. without)	0.6164	1.344	0.423 – 4.274

* UC; urothelial carcinoma

Figure legends

Figure 1 Distribution of node-negative and node-positive patients stratified by the number of nodes removed and cumulative percentage of node-positive patients according to the number of nodes removed. White bars; the number of node-negative patients, black bars; the number of node-positive patients, and plots and line; the cumulative percentage of node-positive patients according to the number of lymph nodes removed.

Figure 2 Disease-specific survival of 146 patients stratified by nodal status. Node-positive (n=25) vs. node negative (n=121) patients, $p < 0.0001$ by log-rank test.

Figure 3 Disease-specific survival according to the number of nodes removed. A; Patients with pathologically organ confined tumor and negative nodes, the number of node removed of = 13 (n=46) vs. < 13 (n=44), $p = 0.604$. B; Patients with pathologically extravesical tumor and negative nodes, = 13 (n=28) vs. < 13 (n=28) nodes removed, $p = 0.113$. C; Node-positive patients, = 13 (n=14) vs. < 13 (n=11) nodes removed, $p = 0.002$. All p-values were determined by log-rank test.

Figure 4 Disease-specific survival of node-positive patients. A; According to the number of positive nodes; = 4 (n=7) vs. < 4 (n=18), $p = 0.003$. B; According to the combination of the numbers of nodes removed and positive nodes; = 13 nodes removed and < 4 positive nodes (n=12) vs. < 13 nodes removed and < 4 positive nodes (n=6), $p = 0.016$, and < 13 nodes removed and < 4 positive nodes (n=6) vs. = 4 positive nodes (n=7), $p=0.499$. C; According to lymph node density; = 20% (n=XX) vs. < 20% (n=XX), $p = 0.0001$. All p-values were determined by log-rank test.

Fig. 1

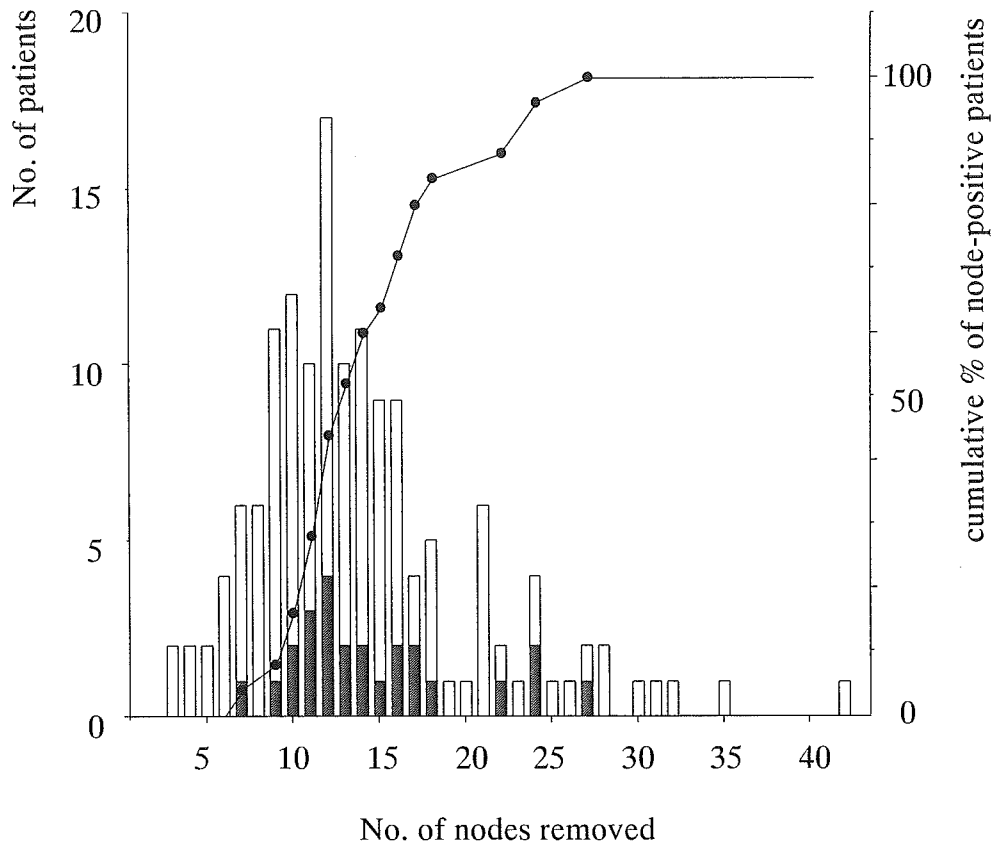


Fig. 2

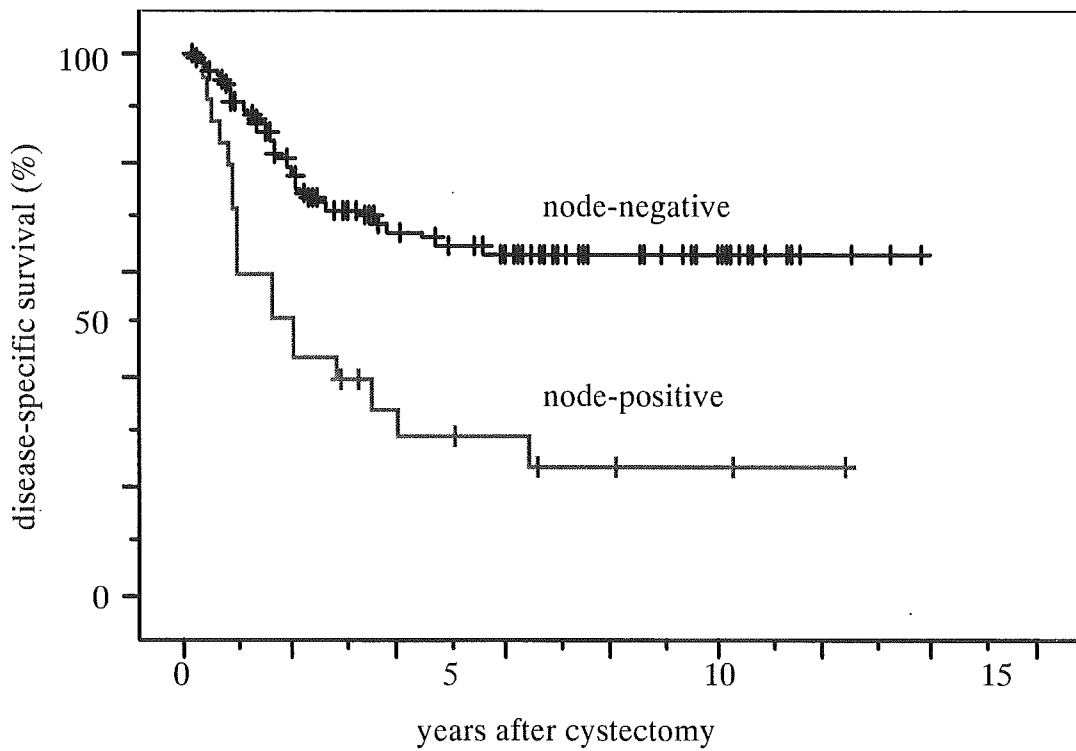


Fig. 3A

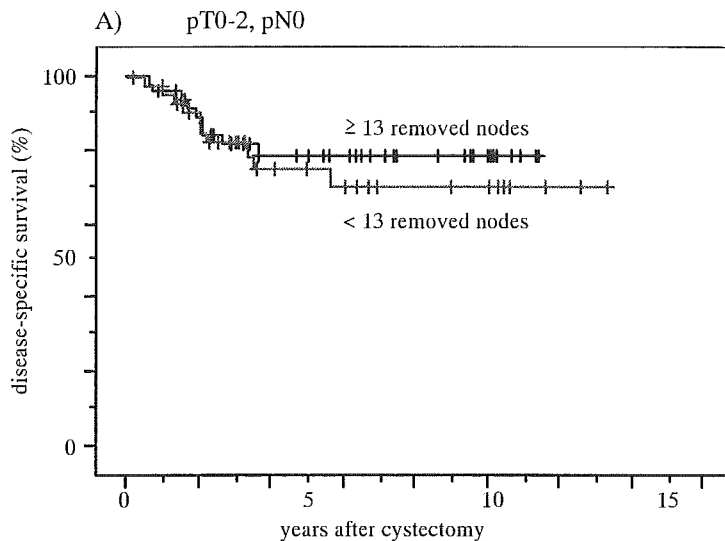


Fig. 3B

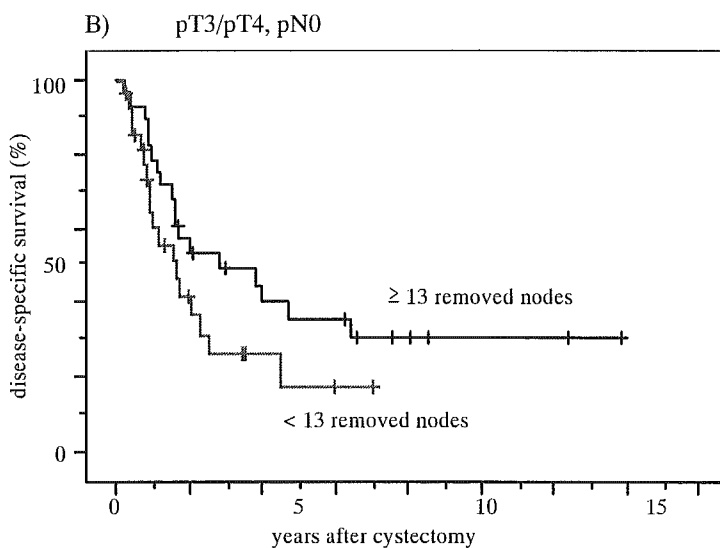


Fig. 3C

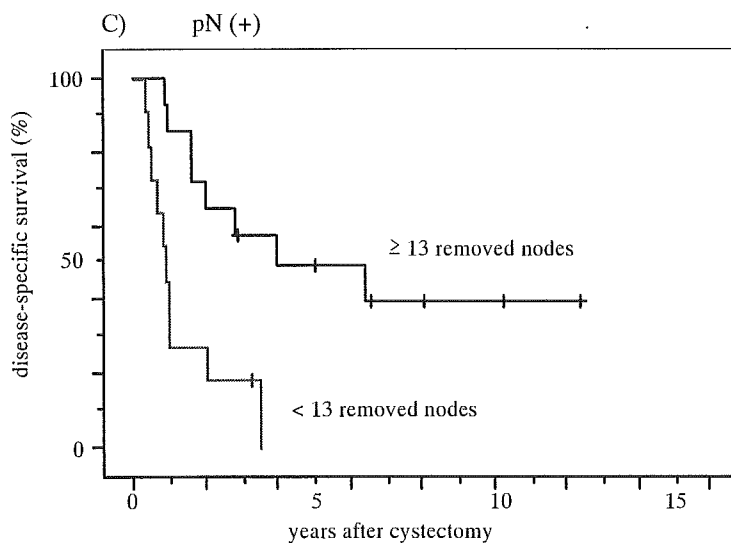


Fig. 4A

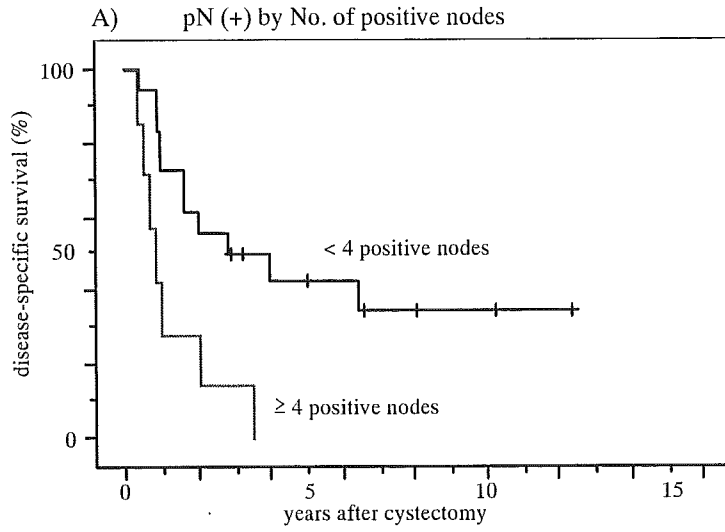


Fig. 4B

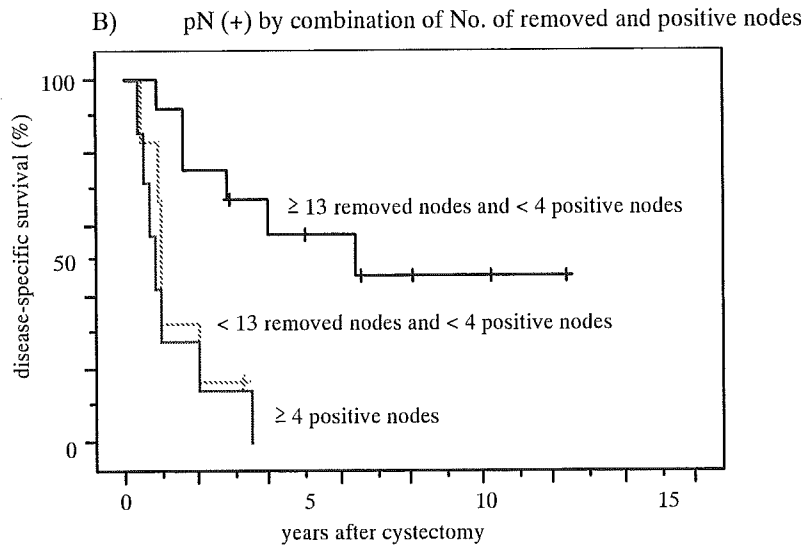


Fig. 4C

