The Role of Lymphadenectomy in the Radical Nephrectomy for Renal Cell Carcinoma

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Key Words
lymphadenectomy; radical nephrectomy; renal cell carcinoma

Background. The value of lymphadenectomy in the management of renal cell carcinoma (RCC) remains controversial. Most would agree that lymphadenectomy (LD) provides accurate pathologic staging for prognostic data. The question remains whether there is any therapeutic benefit from extensive lymph node dissection with radical nephrectomy. The aim of this study was to compare outcomes in sampled lymphadenectomy (SLD) and extensive lymphadenectomy (ELD) with radical nephrectomy for RCC.

Methods. One hundred and thirty-seven patients with RCC were enrolled in this study from Oct. 1982 to Dec. 1996. Eighty-one patients received radical nephrectomy with SLD (stage I: 43, II: 16, III: 22). Fifty-six patients received radical nephrectomy with ELD (stage I: 30, II: 11, III: 15).

Results. The mean number of lymph nodes removed by SLD was 4 (ranged from 1 to 8). The mean number of lymph nodes removed by ELD was 16.1 (ranged from 9 to 32). Overall 5-year survival for SLD in stages I, II and III were 98%, 80% and 38%, respectively. Overall 5-year survivals for ELD in stages I, II and III were 92%, 84% and 40%, respectively.

Conclusions. There is no significant therapeutic benefit from ELD in patients with RCC receiving radical nephrectomy.

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Methods

A retrospective review in this division from October 1982 to December 1996 revealed 215 patients with pathologic diagnosis of RCC. The pathologic stage was determined according to Robson classification. Two patients with stage IV, who did not undergo surgery, who received a partial nephrectomy, or those with incomplete data or loss of follow-up were excluded. Consequently, one hundred and thirty-seven patients with stage I-III RCC receiving radical nephrectomy were selected for this study. ELD for right RCC included hilar, laterocaval, precaval, retrocaval and interaortacaval lymph nodes from the right crus of the diaphragm to the aortic bifurcation. ELD for left RCC included hilar, lateroaortic, preaortic, retroaortic and interaortic lymph nodes from the left crus of the diaphragm to the aortic bifurcation. SLD for right RCC included hilar node with or without laterocaval node. SLD for left RCC included hilar node with or without lateroaortic node. We also dissected the grossly enlarged lymph nodes in the SLD group. ELD or SLD had been at the discretion of the surgeon depending on how many or how large lymph nodes were noted. Post-operatively, pa tients were followed up at our outpatient department at 3-6 month intervals. Survival of patients was diagnosed by CT scan with biopsy and was proved by pathology. The survival rate was determined by the Kaplan-Meier method and a log rank test was used to study statistical difference in survival. A p value less than 0.05 was defined as statistically significant.

Results

Fifty-six pa tients re ceived ELD and eighty-one pa tients re ceived SLD. Clinical data of both groups is shown in Table 1. The pa tients age and sex in both groups were similar. Tumor size and stage between groups was not significantly different. The ELD group had more node dissections than SLD (16.1 nodes vs. 4.0 nodes), however, the incidence of node metastases was not significantly different (14.3% vs. 13.6%). The nineteen pa tients with positive nodes all developed distant metastases later; only one survived more than 5 years. So the 5-year survival among those with positive nodes was 5.3%. The mortality rate and local recurrence rate in both groups was similar. Local recurrence developed in three pa tients re ceiving ELD (stage IIIa: 1, stage IIIb: 2) and 4 pa tients re ceiving SLD (stage I: 1, stage II: 1, stage IIIa: 1, stage IIIb: 1). Survival of pa tients re ceiving ELD and SLD is shown in Fig. 1 and Fig. 2. Early tu mor stages sur vived longer than adv anced stage whether pa tients re ceived ELD or SLD. Ten-year survival was 62.4% in the SLD group and 55.6% in the ELD group, which was not significantly different (Fig. 3). For stage I tu mors, there was no increase in survival in the ELD group compared with the SLD group (Fig. 4). For stage II tumors, the ten-year survival rate was 63% in the ELD.
Fig. 1. Survival rates of patients with renal cell carcinoma received extensive lymphadenectomy. Sub groups were classified according to Robson stage, I, II and III. $p = 0.0002$.

Fig. 2. Survival rates of patients with renal cell carcinoma received sampling lymphadenectomy. Subgroups were classified according to Robson stage, I, II and III. $p < 0.0001$.

Fig. 3. Comparison of survival rates for patients with renal cell carcinoma; stage I-III received radical nephrectomy with extensive lymphadenectomy (ELD) or sampling lymphadenectomy (SLD). $p = 0.571$. 
group and 36.4% in the SLD group (Fig. 5). Though the ELD group survived longer than the SLD group for stage II tumor, there was no statistically significant difference due to limited number. For stage III tumors, no survival benefit was noted between ELD and SLD (Fig. 6).

**Discussion**

The dismal prognosis of patients with RCC involving lymph node has been clearly shown by several studies. The survival rate for RCC patients with positive nodes ranged from 5% to 30% at 5 years and 0% to 5% at 10 years. But the role of lymph node involvement by surgical excision is debated. Peters and Brown reported the 5-year survival rate of RCC with stage III disease who underwent lymphadenectomy was 44% versus 26% for those who did not undergo lymphadenectomy. Golimbu et al. presented valuable data for stage II and III diseases. For stage II, the 5-year survival rate was increased in those who received lymphadenectomy compared to those who did not receive lymphadenectomy (80% versus 65%). For stage III who underwent lymphadenectomy, the 5-year survival rate was 60% versus 47% for those...
who did not undergo lymphadenectomy. Herrlinger et al. found patients with stage I and II obviously benefited from systemic lymphadenectomy rather than facultative lymphadenectomy in 10-year survival rate (80% versus 54% for stage I and 58% versus 41% for stage II). Our data showed only stage II had therapeutic benefit from receiving extensive lymphadenectomy in 10-year survival rate (63% versus 36%). These results are similar to Herrlinger’s, but these data are retrospective and from a nonrandomized study, so the answer of whether extensive node dissection improves survival remains controversial. The stage of migration may explain the better survival rate seen by investigators who routinely perform extensive lymphadenectomy. Step-sectioning technique increases the detection of 24% of micrometastases that would not be identified by a routine histology examination.

Siminovitch et al. suggested that only early metastases could benefit from a lymphadenectomy removing the hilar lymph node. Giuliani et al. reported a 63% 5-year survival rate for RCC patients with less than 2 positive nodes vs. a 36% 5-year survival rate for those with more than 2 positive nodes removed by extensive lymphadenectomy. We didn’t find any difference in survival rate based on which nodes were involved or how many nodes were positive. Because the anatomic distribution of lymphatic metastases is unpredictable, hilar nodes are involved by tumors in only 13-33% of patients with node metastases. Johnsen and Hellsten in a study of 554 cases of RCC diagnosed at autopsy, detected lymphatogenous dissemination in 80 (14%) cases of which 75 had multifocally extrarenal lymph node metastases. They noted the therapeutic effect of extensive retroperitoneal lymph node dissection in only 5 (0.9%) cases where metastasis was restricted to the paracaval and/or paraaortic lymph nodes.

The incidence of positive lymph nodes in surgical specimens ranged from 9 to 27.3%. In our experience, the incidence of node metastases was 13.9%, showing no difference between ELD and SLD. In our series, the bias was not due to the operating surgeon’s decision to perform ELD in patients who had very large nodes. Macroscopic nodes (more than 1 cm diameter) were found in 28 cases, 18 cases received ELD and 10 cases received SLD. The incidence of positive nodes among macroscopic nodes was 42% (12/28), including 50% (9/18) in ELD and 30% (3/10) in the SLD group. The presence of adenopathy does not imply nodal metastases, as only 31.2% of the nodes were positive in patients with enlarged nodes. We agree with this opinion.

Fig. 6. Comparison of survival rates for patients with renal cell carcinoma; stage III received radical nephrectomy with extensive lymphadenectomy (ELD) or sampling lymphadenectomy (SLD). p = 0.328.
patients without lymphadenectomy. Other investigators have also shown a reduction in the local cure rate to 2.5%, 4 6 8 or 8%. 14 We did not find a difference in local cure rate by the ELD and SLD groups. Local cure was seen in 7 patients (stage I: 1, stage II:1 stage III: 5). The two patients in stage I or stage II with local cure were in the SLD group; per haps there were in completely re moved macroscopic nodes. Operative mortality is <1% to 5% in extensive sive nephrectomy, so ELD is not considered to increase mortality. 5,6 Our re sults agree with this. Further more, Phil lips re ported lymphadenectomy did not extend hospitalization or add to the mor bid ity of radical nephrectomy. 3

From our data, the ELD group had a lower 10-year surv ival rate than SLD group in stage I RCC, be cause four of 30 patients in stage I RCC who re ceived ELD died of suture blood borne metastases. Blood borne met astases with out lymph node in volve ment has been found in 30% of RCC. 12 ELD can not pre vent sanguine metastases.

In the absence of completely ran domized studies, the net ben e fit of lymphadenectomy was roughly determined by Srougi. 12 For every 100 pa tients with RCC under going ELD, only 2 to 6% ben e fit from the sur gery and would sur vive 5 years. 9,12,21,22 Probably only pa tients with limited nodal in volve ment or oc cult micro scopic dis eases which the pa tholo gist did not de tect have therapeutic benefit from ELD. ELD does iden tify a higher in ci dence of posi tive nodes. 5,8 We sug gest SLD is nec es sary for ac cu rate stag ing, espec ially in pa tients with mac ro scopic adenopathy at sur gery. ELD can be considered for exact stag ing if frozen sec tions of the mac ro scopic nodes show neg a tive. ELD followed by radical nephrectomy has a slight sur vival ben e fit in pa tients with stage II RCC, but there is no sta ti s ti cally sig ni ficant dif fer ence. We con cluded there is no sig ni ficant ther apy ben e fit from ELD in pa tients with RCC receiving radical nephrectomy.

References

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