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Topographic distribution of lymphatic oligometastases in patients with renal cancer

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Background

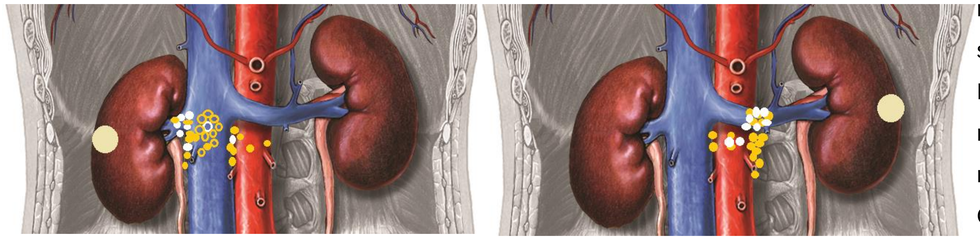
Lymphatic drainage of renal cell carcinoma (RCC) is unpredictable and the role of lymph node dissection (LND) remains controversial. However, adjuvant studies with checkpoint inhibitors have sparked new interest in accurate pathological lymph node staging in RCC. Recently, sentinel lymph node (SN) studies revealed the pattern of lymphatic drainage from renal tumours[123]. Nevertheless, it is unknown if the location of early pN1 lymph node metastases found at LND match the SN drainage pattern .

Aim of the study

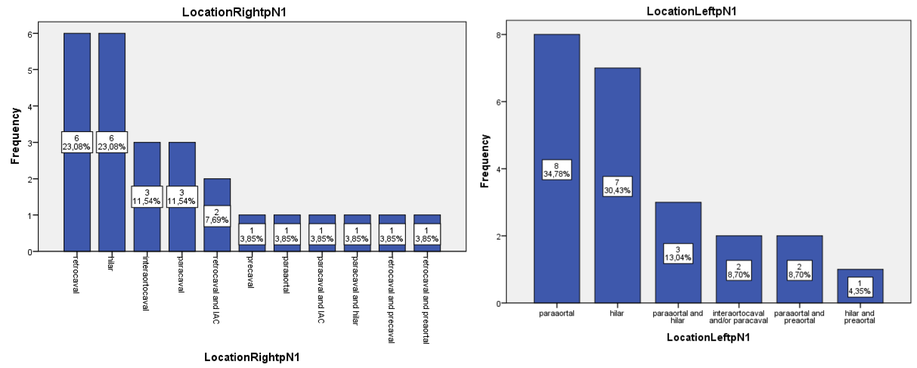
To describe the location of single- or oligo-metastatic lymph nodes and analyze if the pattern of this early lymphonodular tumour drainage matches the drainage pattern observed in SN studies of renal tumours[123].

Materials & Methods

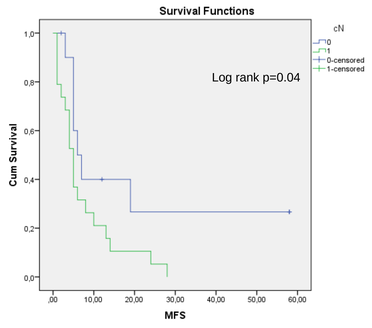
After institutional review board approval, we collected data from 5 different centers from 1990-2018 of all patients with pT1-4 M0 RCC with pathologically confirmed single- or oligo-metastases in locoregional lymph nodes, presenting as either cN0 or a single cN1 node on imaging. Collected data included location of the lymph node metastases, number, size of metastatic lymph nodes and survival. We analyzed the data using descriptive statistics showing the location of metastatic lymph nodes and Kaplan Meier survival models for evaluating survival differences between cN0/pN1 and cN1/pN1 cases using SPSS version 22 (IBM, Chicago, IL, USA).



Right and left renal cancer sites of cN0 (white) and cN1 (yellow) metastatic lymph nodes. Yellow lymph nodes without filling are dorsally located, retrocaval lymph nodes.



A. Bar chart showing pN1 metastatic LN locations on right and left side.



Risk table

Time (months)	0	6	12	19	24	28	58
cN0	16	5	3	2	2	1	0
cN1	33	13	8	2	1	0	0

Kaplan Meier curve showing metastases-free survival of cN0 and cN1 all pN1 lymph node oligometastatic RCC cases.

Results

We identified a total of 49 patients, with histologically confirmed pN1, of whom 16 (32.7%) and 33 (67.3%) with cN0 and cN1 at diagnosis, respectively. The majority (36 73.5%) represented clear cell RCC. The right side was involved in 26 (53.1%) and the left side in 23 (46.9%) patients. Primary tumours were pT2b in 26.5% and pT3a in 32.7%. The median number of detected LN metastases at LND was 2.0 (IQR 1-3) with a median number of LNs removed of 4.5 (IQR 2-8.7).

On the left side, LN metastases were predominantly located in the paraaortal (34.7% (95% CI 17.19-57.18%)) and hilar (30.4% (95%CI 14.05-53.0%)) area, matching the paraaortal and hilar drainage observed in SN studies.

On the right side, metastases located in retrocaval (23.0% 95% CI 9.7-44.0%)), hilar (23.0% 95% CI 9.7-44.0%)) and interaortocaval (11.5% 95%CI 3.0-31.2%)) LNs, following the drainage pattern reported in SN studies on the right side.

There was no statistical significant distant metastasis free survival (MFS) between cN0/pN1 or cN1/pN1 patients.

Conclusions

Early single- or oligo-metastatic LNs in renal cancer are mainly located in the hilar, retro- and interaortocaval region on the right side and paraaortal region on the left side. These locations match with the drainage pattern reported in SN trials. MFS for occult lymph node metastatic patients is not better compared to cN1 cases. However, the outcome needs to be reproduced in a larger cohort.

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