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Audit

The degree of compliance with the guidelines provided by the Royal College of Pathologists (UK) in reporting adult renal parenchyma neoplasms in a tertiary care centre in Sri Lanka

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Abstract

Introduction and objectives: Renal cell carcinomas comprise approximately 3% of all adult malignancies. The Royal College of Pathologists (RCPath) dataset for histopathological reporting of adult renal neoplasms recommends including a set of minimum clinical details, appropriate sampling, and macroscopic and microscopic core-data items in renal tumour reports. The aim of this audit was to assess compliance with recommended sampling and core data items as per the RCPath datasets in a tertiary care centre and to assess whether the quality of reporting was improved with the introduction of a reporting proforma.

Methodology: The data from 25 nephrectomy specimens, including eight partial and 17 radical nephrectomies, were included in the initial audit. The level of compliance with 45 core-data items was recorded as percentages. A re-audit was performed on 23 random nephrectomy specimens (seven partial and 16 radical) reported in 2021 after introducing a reporting proforma which was used as a checklist for handling and reporting nephrectomy specimens. The same data collection sheet was used in both audits.

Results: A significant improvement in both gross examination and histopathological reporting of nephrectomy specimens, including 100% compliance with two-thirds of data items, was noted after the introduction of the reporting proforma. A few data items, such as clinical details regarding the presence of the adrenal gland, need further improvement.

Discussion and conclusion: Using a reporting proforma on gross examination and reporting of nephrectomy specimens and performing periodic audits are recommended to deliver a good quality histopathology report, which is crucial for clinical management and decision-making.

Keywords: renal cell carcinoma, nephrectomy, checklist

Introduction

Renal cell carcinoma (RCC) is the commonest renal malignancy, accounting for 3% of all adult malignancies, ranked the ninth and fourteenth cancer encountered in men and women, respectively, and the sixteenth cause of mortality from cancer worldwide (1). The five-year prevalence of RCC was 3.27% in Sri Lanka for all ages in 2018 (2).

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The 5th edition of the World Health Organization classification of renal tumours includes many subtypes; clear cell renal cell carcinoma is the commonest with an incidence of 60-75% of all RCCs (3).

The incidence rate of RCC continues to rise. This may be attributable to the increased use of diagnostic imaging for other diseases (4).

Approximately 30% of patients present with metastatic RCC (4). The recurrence rate of RCC is approximately 30% for localised disease at the time of nephrectomy (4). Nearly 60% of patients diagnosed with RCC require a major surgical resection, with radical nephrectomy being the standard curative treatment for localised tumours that are not amenable to nephron-sparing surgery (partial nephrectomy) (4). RCC most commonly metastasise to lymph nodes, liver, brain, bone, adrenal glands and lungs (4). Metastases may also occur at unusual sites many years after the initial diagnosis (4). The 5-year survival rate in metastatic disease is less than 10% and effective treatment is challenging (4). The Royal College of Pathologists (RCPath) dataset for histopathological reporting of adult renal parenchyma neoplasms recommends including minimum clinical details, appropriate sampling and macroscopic and microscopic core data items in the histopathology report (4).

In addition to maintaining consistency in reporting pathological risk factors, there are other benefits of conforming to guidelines, especially for optimizing patient management, prognostication and follow-up. These may vary depending on the tumour subtype and clinical context and will allow the patients to make informed decisions about treatment options. Adoption of a consistent approach to the classification and risk assessment of renal tumours is also essential for audit and epidemiological studies.

Periodic assessment of the reporting through audits is mandatory to maintain the quality of reporting in accordance with the standard guidelines.

Our objectives in auditing the histopathological reporting of renal tumours in adults were;

1. to determine the adequacy of the clinical information provided.

2. to assess the quality of sampling at the time of specimen grossing.

3. to assess whether the core data items have been included in the pathology report.

4. to highlight the importance of using a reporting proforma to increase the quality of the histopathology reporting.

Methodology

The standards audited were the core data items that should be recorded based on the RCPath guidelines for histopathological reporting of adult renal parenchymal neoplasms 2017 (4). These were listed in the data collection sheet. The audit criteria for each of the standards was 100% compliance for each data item (or, if not achieved, the presence of documentation that explains the variance).

For the initial audit, 25 cases of RCC reported in the Department of Pathology, Faculty of Medicine, University of Colombo, from 01.01.2020 to 30.11.2020 were selected randomly from the local archives. This comprised eight partial and 17 radical nephrectomy specimens. The compliance with each of the criteria in the dataset was documented in the data collection sheet and the overall percentage of adherence was calculated for each of the criteria (Table 1).

Following the initial audit, a reporting proforma was developed and was introduced to all the histopathology trainees and histopathologists in the Department to be used as a checklist while handling and reporting nephrectomy specimens (Figure 1).

After introducing the reporting proforma, a re-audit was performed on 23 randomly selected cases reported from 01.01.2021 to 31.12.2021. This comprised seven partial and 16 radical nephrectomy specimens. The same data extraction sheet was used to record the data.

The results (percentage compliance of clinical, macroscopic and microscopic core data items) of the initial audit performed on cases reported in 2020 and the re-audit performed on cases reported in 2021 were compared (Table 1).

Items to be reported	% compliance	
	2020 (n=25)	2021 (n=23)
Clinical details supplied		
1. Specimen laterality	100%	100%
2. Type of surgical procedure (partial/radical)	100%	100%
3. **Ipsilateral adrenal gland is included/not (in radical nephrectomy)***	**0%**	**13%**
Sampling and block selection		
Radical nephrectomy		
1. Renal vein surgical margin	100%	100%
2. Renal arterial surgical margin	100%	100%
3. Tumour blocks, to represent;		
I. all areas with different macroscopic appearances (1 block/cm)	100%	100%
II. **necrosis with adjacent tumour***	**0%**	**13%**
III. interface with perinephric fat	100%	100%
IV. minimum distance to perinephric surgical margin or hilar soft tissue margin (if <10 mm)	100%	100%
V. **interface with renal sinus tissue (minimum 3 blocks)***	**90%**	**100%**
VI. any direct contiguous extension into adrenal gland	100%	100%
VII. interface with normal parenchyma	100%	100%
VIII. adjacent renal pelvis	100%	100%
. Uninvolved renal parenchyma	100%	100%
. Any other incidental or satellite lesions	100%	100%
. Adrenal gland	100%	100%
. Ureteric surgical margin and any focal ureteric lesions	100%	100%
. All hilar lymph nodes	100%	100%
Partial nephrectomy		
1. Tumour (1 block/cm)*	**87.5%**	**100%**
2. Tumour with areas of suspected perinephric fat invasion, and (if included) renal sinus invasion	100%	100%
3. Tumour and closest parenchymal margin	100%	100%
4. Tumour and closest perinephric fat/capsular margin (if <10 mm)	100%	100%
5. Uninvolved renal parenchyma	100%	100%
Macroscopic core items		
1. Tumour focality (unifocal/multifocal)*	**0%**	**100%**
2. Tumour size	100%	100%
Microscopic core items		
1. Histological tumour type	100%	100%
2. Tumour grade	100%	100%
3. **Tumour necrosis***	**84%**	**100%**
4. **Sarcomatoid morphology***	**92%**	**100%**
5. **Rhabdoid morphology***	**92%**	**100%**
6. **Perinephric fat invasion***	**96%**	**100%**
7. Renal sinus invasion	100%	100%
8. **Renal vein involvement***	**96%**	**100%**
9. **Lymphovascular invasion***	**56%**	**87%**
10. **Invasion of the pelvicalyceal system***	**52%**	**96%**
11. **Adrenal involvement***	**88%**	**96%**
12. Lymph node involvement	96%	96%
13. Margin status		
Radical nephrectomy		
I. ureter	100%	100%
II. hilar vessels	100%	100%
III. perinephric fat/Gerota's fascia	100%	100%
IV. renal sinus soft tissue margin#	**100%**	**83%**
Partial nephrectomy		
I. parenchymal (intra-renal) surgical margin	100%	100%
II. perinephric fat/renal capsular margin (if no fat is present)*	**87.5%**	**100%**
14. Non-neoplastic kidney	100%	100%
Pathological staging		
1. TNM staging	100%	100%

Table 1. Percentage compliance of clinical, macroscopic and microscopic core data items.
Note: The items showing an improvement in reporting are indicated with a '' and the items showing a reduction in compliance is indicated with '#'.*

Results

The results of the initial audit performed in 2020 and the re-audit performed in 2021 are summarised in Table 1. The core data items which showed a difference in the percentage compliance in the re-audit in 2021 compared to the initial audit in 2020 are highlighted in Table 1 and summarised in Figure 2.

Clinical information on the preservation or removal of the ipsilateral adrenal gland was lacking in all 25 cases in 2020. A slight improvement was noticed in the re-audit performed in 2021 with 13% of the cases

Clinical core data

1. **Specimen laterality** – Right / Left / Not mentioned
2. **Nature of surgical procedure** – Radical/Simple/Partial nephrectomy/Not specified/ Other…
3. **Adrenal gland** – Absent / Present
4. **Lymph nodes** – Absent / Present
5. **Other structures** – Absent / Present……

Macroscopic core data

1. **Tumour focality** – Unifocal **/** Multifocal **/** Cannot assess
2. **Maximum tumour dimension** ……..mm (largest 5)
3. **Presence of tumour in major veins** – Present **(**Renal vein/IVC/both) / Absent / Cannot assess

Microscopic core data

1. **Histological tumour type** – Clear cell / Papillary (Type 1 / 2) / Chromophobe/ Other.....
2. **Tumour grade** – Not applicable / Grade 1 / 2 /3 / 4
3. **Sarcomatoid morphology** – Absent / Present
4. **Rhabdoid morphology** – Absent / Present
5. **Tumour necrosis** – Absent / Present (Macroscopic/Microscopic) / Cannot assess
6. **Microscopic extent of invasion**
   - **I. Perinephric fat invasion** – Absent / Present / Cannot assess / Not applicable
   - **II. Gerota's fascia invasion –** Absent / Present / Cannot assess / Not applicable
   - **III. Renal sinus invasion** – Absent / Present / Cannot assess / Not applicable
   - **IV. Invasion of renal vein and tributaries** – Absent/Present/Cannot assess/Not applicable
   - **V. Invasion of pelvicalyceal system** – Absent / Present / Cannot assess / Not applicable
   - **VI. Lymphovascular invasion** – Absent / Present
   - **VII. Adrenal gland invasion** – Absent / Present (Direct extension/Metastases)
   - **VIII. Invasion into other organs/structures (if present)** – Absent / Present (sites…….)
7. **Regional lymph nodes status** – Present / Absent / Not applicable
   If present; Total number of lymph nodes examined ……..
   Number of positive lymph nodes…….
   Size of largest focus …….. mm
   Extranodal extension – Absent / Present / Cannot assess
8. **Resection margin status**
   Radical nephrectomy
   - **I. Ureter** – Involved / Not involved (…….mm) / Cannot assess
   - **II. Hilar vessels** – Involved / Not involved (…….mm) / Cannot assess
   - **III. Perinephric fat/Gerota's fascia** – Involved / Not involved (…….mm) / Cannot assess
   - **IV. Renal sinus soft tissue margin** – Involved / Not involved (…….mm) / Cannot assess

   Partial nephrectomy
   - **I. Parenchymal surgical margin** – Involved/Not involved (mm)/Cannot assess
   - **II. Perinephric fat/renal capsular margin (if no fat is present)** – Involved / Not involved (…….mm) / Cannot assess
9. **Co-existing pathology in non-neoplastic kidney** – Insufficient tissue for evaluation/No background pathology identified /Present…….. …
10. **Metastatic spread** – Not applicable / Absent / Present (site: ……)
11. **Tumour stage (TNM edition - 8)** – pT….. pN….. pM….. (M1 only, if applicable)

Figure 1. Reporting proforma for nephrectomy specimens

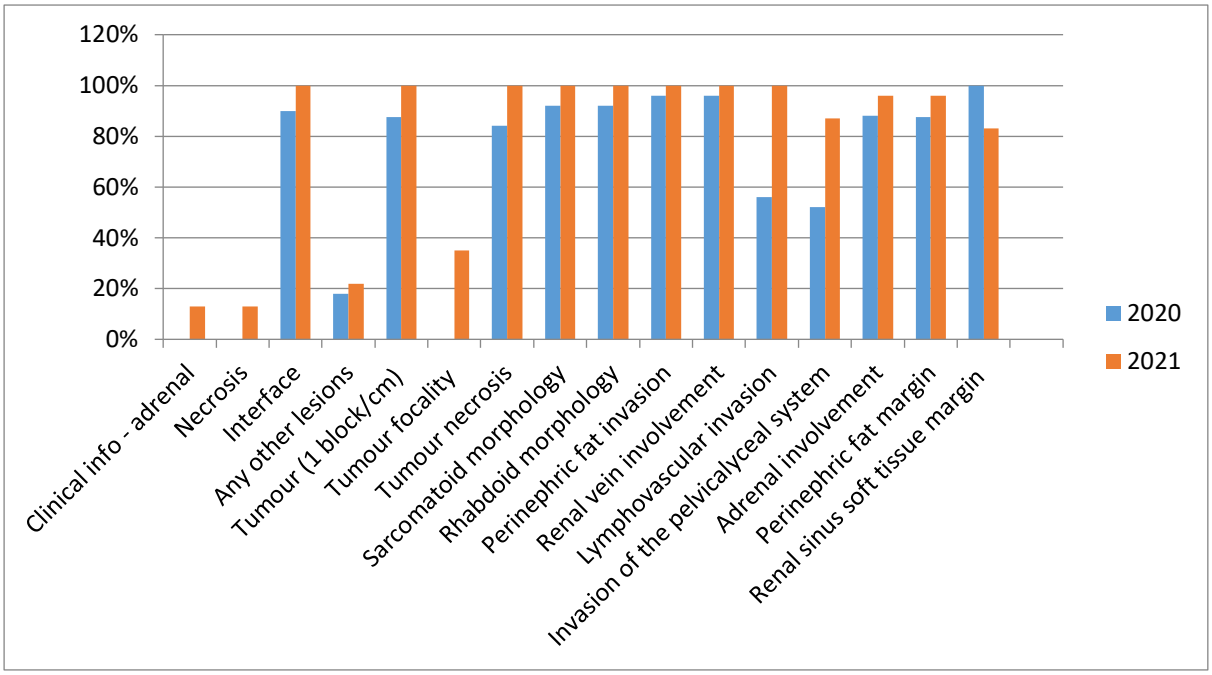

Figure 2. Core data items which showed an improvement or decline in the percentage compliance (2021) compared to the audit in 2020

reporting the status of the adrenal gland. Sampling of a tumour section as 'tumour with adjacent necrosis' was missing in all 25 cases in 2020, however, a slight improvement (13%) was noticed in the re-audit.

Less than three sections from the interface between the tumour and the renal sinus tissue were included in four specimens (one specimen – one section, three specimens – two sections) in 2020. However, after the introduction of the reporting proforma, 100% compliance with sampling of a minimum of three blocks was achieved in 2021. All the incidental/satellite lesions were sampled according to both audits however, such lesions were encountered only in 18% of cases in 2020 and 22% in 2021.

The adrenal gland was not identified in a majority of the specimens in both audits but was recorded as 'not identified' in the final report in a majority of radical nephrectomy specimens (88% in 2020 and 96% in 2021).

Tumour focality was not recorded in any of the cases in 2020. However, this was improved to a value of 35% in 2021, where tumour focality was mentioned in the body of the report of all cases, although not documented as a separate core data item in the conclusion.

Invasion of the pelvicalyceal system was mentioned only in 52% of the reports in 2020. However, recording of this improved significantly (96%) in the subsequent year. This is a core data item that recognoizes stage pT3a tumours in TNM 8 and its presence is associated with poor survival according to some studies (1).

In the re-audit, 100% compliance was reported in the documentation of the following microscopic core data items; absence/presence of necrosis, rhabdoid and sarcomatoid morphology and status of perinephric fat resection margin (in partial nephrectomy); and more than 95% compliance was seen in the reporting of microscopic core data items of invasion of the pelvicalyceal system, adrenal gland and lymph node status.

However, a decline in compliance was noted in recording the status of renal sinus soft tissue margin in radical nephrectomy specimens from 100% in 2020 to 83% in 2021.

Discussion and conclusion

The level of adherence to the RCPath dataset is generally satisfactory according to the results (esp. margin status), with only a few aspects being deficient despite the limited resources available (e.g. the number of cassettes) at the department laboratory. Most core data items showed >80% compliance even before the introduction of a reporting proforma. A significant improvement was noted in the quality of macroscopic handling and reporting of adult renal neoplasms after the introduction of the reporting proforma.

Although sampling of a separate block for 'tumour with adjacent necrosis' was not documented in the majority of the cases, the microscopic evidence of tumour necrosis was mentioned in most of the cases. It is recommended that any amount of necrosis should be reported for prognostic algorithms, and only the microscopic tumour necrosis is considered prognostically significant (4).

Thorough sampling of fatty tissue in the upper pole of the kidney was carried out in all the radical nephrectomy specimens including the cases where a separate section was not taken as 'adrenal gland'. When information on the removal or preservation of the adrenal gland was not recorded in the request form, this was obtained over the phone in both audits. According to the TNM 8 classification, for tumour staging, it is important to recognize whether the adrenal gland is directly invaded by the renal tumour (stage pT4) or whether the involvement is in the form of discrete metastatic nodules (stage pM1) (4).

The constant lack of the required clinical information, such as the status of the adrenal gland, is a significant finding in this audit, with only a little improvement seen in the re-audit.

In an audit performed on 160 selected pathology reports of adult renal cancers by Dabner et al. in Perth, Australia, it was noted that none of the request forms had the required clinical information (5). The preoperative diagnosis, laterality of tumours and operative procedure were mentioned in 40%, 97% and 63% of cases, respectively (5). This indicates that the information provided to pathologists was often deficient when compared with the standards and the guidelines, although it is possible that the information subsequently retrieved from the clinicians might not have been documented in at least a proportion of cases.

In Sri Lanka, an audit was performed in 2006 by Gunaratne et al. using 134 colorectal cancer reports in a tertiary care unit and the findings were compared with a similar Sri Lankan audit performed by Hewavisenthi et al. in 2000 (6,7). The recommendation was to use a proforma containing minimum core data items for reporting colorectal cancer to rectify any omissions (6). A similar audit and a re-audit were performed by Ram et al. in the United Kingdom in 2014 and 2018, respectively. The aim of this audit was to assess compliance with RCPath guidelines in handling and reporting oesophagectomy and gastrectomy specimens (8). This study included both pre-treatment and post-treatment (with neoadjuvant chemo-radiotherapy) specimens (8). One of their recommendations was also to use a reporting proforma for both macroscopic handling and microscopic reporting of specimens (8).

To the best of our knowledge, there are no published audits on the quality of histopathology reporting of renal tumours in the local setting.

Recommendations

The consistent use of a reporting proforma is recommended to maintain and to further improve the optimum handling and reporting of partial and radical nephrectomy specimens. However, the reporting proforma also needs to be reviewed and updated periodically based on the latest national/international guidelines. The clinicians should be made aware that the status of the adrenal gland (preserved or

removed during the surgery) needs to be mentioned in the request form.

Carrying out re-audits annually or biennially is recommended to ensure the quality of the final histopathology report.

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