



ORIGINAL ARTICLE

Indications for adrenalectomy during radical nephrectomy for renal cancer



Ahmed H. Gabr ^{a,b,*}, Zoe Steinberg ^c, Scott E. Eggener ^c, J. Stuart Wolf Jr. ^d

^a Department of Urology, Minia University, Egypt

^b Department of Urology, Salman Bin Abdulaziz University, Saudi Arabia

^c Section of Urology, University of Chicago, Chicago, USA

^d Department of Urology, University of Michigan, Michigan, USA

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KEYWORDS

Nephrectomy;
Adrenalectomy;
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ABBREVIATIONS

RN, radical nephrectomy;
IA, ipsilateral adrenalectomy

Abstract Objectives: To determine if the selection criteria for ipsilateral adrenalectomy during laparoscopic radical nephrectomy (RN) can be further restricted, with the goal of sparing more patients unnecessary adrenalectomy while preserving the removal of adrenal glands containing malignancy, as recent evidence suggests that adrenalectomy in association with RN for renal cancer can be limited to patients with abnormalities on adrenal imaging or large upper-pole renal tumours.

Patients and methods: The cohort consisted of two data sets, each from one institution, i.e., a training set and a validation set. All patients underwent RN for radiographically localised disease. Removal of the adrenal gland was based on the surgeon's preference, related to the presence of a suspect adrenal lesion on preoperative imaging, suspicion for involvement of the adrenal gland intraoperatively, location of the tumour, size of the tumour and local tumour stage.

Results: Of 159 patients in the training cohort, three (2%) had metastatic renal cancer in the ipsilateral adrenal gland. All three patients had tumours of > 7 cm and either an abnormal radiographic appearance of the adrenal gland or suspect intraoperative findings. In the validation cohort of 74 patients, seven (10%) had adrenal metastasis, of which one had a tumour of < 7 cm and the indication for adrenalectomy was the high intraoperative suspicion.

* Corresponding author at: Department of Urology, Minia University, Minia, Egypt. Tel.: +966 569267117, +201002557332.

E-mail address: aradwan76@hotmail.com (A.H. Gabr).

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Conclusion: We recommend performing ipsilateral adrenalectomy in association with RN for renal cancer when there is either abnormal radiographic appearance of the adrenal gland or suspect intraoperative findings, with no regard for primary tumour size.

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Introduction

Malignancy of the kidney and renal pelvis is the third most common urological malignancy, the seventh most common cancer overall, and accounts for almost 4% of adult cancers [1]. RCC is the most common malignancy of the kidney and renal pelvis [1]. Laparoscopic radical nephrectomy (RN) is a preferred method for dealing with RCC not amenable to nephron-sparing treatment because of the more rapid convalescence and better cosmesis compared to open RN. As proposed by Robson et al. in 1969 [2], ipsilateral adrenalectomy (IA) was viewed as an integral part of the procedure because of the simplicity of the technique and the concept that this aggressive approach provided better oncological control than simple nephrectomy [3]. Although recent reports suggest that routine IA is not useful for controlling disease [4], it is probably beneficial to remove an adrenal gland containing RCC if that metastasis is isolated, as $\approx 60\%$ will experience a 5-year cure with no further therapy [5]. However, there are potential disadvantages to IA. Metachronous metastasis to the contralateral adrenal gland might necessitate subsequent IA [6] and permanent corticosteroid replacement. Also, subclinical adrenal insufficiency can adversely affect health, as suggested by the recent work of Yap et al. [7] which suggests that RN with IA is associated with a lower overall survival than adrenal-sparing RN.

However, with the current stage migration of RCC, isolated and synchronous ipsilateral adrenal gland metastasis is rare, occurring in $< 5\%$ of RN specimens [8,9]. Recent evidence suggests that IA can be limited to patients with an abnormal adrenal gland on imaging, or with large tumours in the upper pole [8]. Despite this consensus, IA is still performed frequently in association with RN [9,10]. Even when IA is limited to patients with an abnormal adrenal gland on imaging or large tumours in the upper pole, RCC is found in the adrenal gland in only a small fraction of specimens [9,11,12]. This suggests that it might be possible to restrict the indication for IA even more, although this might be appropriate only if such restriction does not reduce the removal of adrenal glands involved by RCC. Some authors have recently suggested that IA can be reserved for patients with radiographic or intraoperative evidence of adrenal involvement, regardless of tumour size [13–15]. The positive predictive values of imaging to predict adrenal

metastases are $< 50\%$ [6], suggesting that further improvements to determine the indications for IA are needed.

The aim of the present study was to determine if the selection criteria for IA as part of laparoscopic RN can be further restricted, with the goal of sparing more patients an unnecessary IA while still preserving the removal of adrenal glands containing RCC.

Patients and methods

The cohort consisted of two data sets, each from one institution. The training cohort was used to compose the selection criteria and the second data set was used as a validation cohort. From the prospective database from one institution, approved by the Institutional Review Board, we identified 159 patients for the training cohort who underwent laparoscopic RN with IA between August 1996 and January 2013. Surgery was undertaken using standardised techniques of conventional, hand-assisted and robotic-assisted laparoscopy.

From the prospective database of another institution, approved by the Institutional Review Board, 74 patients for the validation cohort who had a RN with IA between May 2003 and June 2013. Surgery was undertaken using standardised techniques of conventional, hand-assisted and robotic-assisted laparoscopy, as well as open surgery.

The removal of the adrenal gland was determined by surgeon preference, related to the presence of a suspect adrenal lesion on preoperative imaging (or inability to define a normal adrenal gland), suspected involvement of the adrenal gland intraoperatively, location of the tumour, size of the tumour and local tumour stage. Patients were evaluated after surgery every 6–12 months, with laboratory tests and imaging, and after 2–3 years the frequency of surveillance was decreased.

Results

Training data set

Of 159 patients in the training cohort who had a laparoscopic RN with concurrent IA, 74 (46%) had a primary tumour of > 7 cm. Among these 74 patients, 22 had an abnormal radiographic adrenal appearance (12 with adrenal nodules, two with a thickened/enlarge adrenal

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