

Oncology

Intravenous pyogenic granuloma of the renal vein: A rare morphological differential diagnosis to renal cell carcinoma



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ABSTRACT

We report the fourth case reported world-wide of an intravenous pyogenic granuloma (IVPG) originating from a renal vessel. This rare and benign tumor is mostly found in the head and neck region and has been described very rarely in association with the kidneys. By reviewing the characteristics of all published cases we suggest diagnostic and therapeutic strategies for patients with possible IVPG in the renal vessels out of the view of highly experienced surgeons specialized in advanced Inferior Vena Cava-thrombectomy.

Introduction

Intravenous pyogenic granuloma (IVPG) or intravenous lobular capillary haemangioma (ILCH) is a rare, benign tumor usually occurring in the head and neck region.¹ So far, only three cases of patients with IVPG located in the renal vein and thus mimicking renal cell carcinoma morphologically have been described.^{2–5} In all patients radical nephrectomy was performed. We present the case of a 78-year-old woman and review the cases reported so far in order to evaluate future diagnostic and therapeutic efforts.

A 78-year-old woman was transferred to our department with an unclear right-sided pararenal mass. Initially, the diagnosis was made by sonography during a routine check-up. She reported of no flank pain, no macrohaematuria, or any other symptoms. Physical examination was unremarkable. All lab results, especially renal parameters were within normal limits. CT- and MRI-scan revealed a retroperitoneal tumor with contact to the renal vein, as well as the renal pelvis. There were no signs of metastases. Ureterorenoscopy and retrograde pyelography ruled out an intrapelvic lesion or tumor invasion of the renal pelvis.

Differential diagnoses were renal cell carcinoma with contact to the renal vein or sarcoma of the renal vein as well as extrarenal RCC. A possible IVPG was not discussed as a differential diagnosis.

As a preoperative biopsy was considered too risky concerning uncontrollable bleeding due to the proximity to the renal hilum, surgical removal was indicated. After appreciating an intravascular solid mass, we performed open radical nephrectomy with regional lymphadenectomy.

Upon resection, the nephrectomy specimen displayed a hilar 2.9 cm

measuring partly solid, partly cystic lesion, grey-brown in color, attached to the wall of the renal vein (see Fig. 1). Histopathologic examination revealed a mesenchymal tumor consisting of variable large, anastomosing vessels filled with erythrocytes and lined by CD31- and CD34-positive endothelial cells with minor nuclear pleomorphism and a narrow eosinophilic cytoplasmic rim. There were no mitotic figures on H&E and a proliferation < 1% on mib-immunohistochemistry (Ki-67). These findings were in accordance with a diagnosis of IVPG.

Our patient recovered well and was dismissed in good condition on the 7th post-operative day.

Methods

Scientific publications within the English literature reporting IVPG associated to the kidneys were sought using PubMed between 1976 and April 2019. Search terms used were ‘intravenous lobular capillary haemangioma’, ‘intravenous pyogenic granuloma’, ‘intravascular lobular capillary haemangioma’, ‘capillary haemangioma’ and ‘pyogenic granuloma’ combined with ‘renal’, ‘vein’ or ‘vessel’.

Results

The literature research revealed 41 papers. Three of them were considered to be relevant in the context of IVPG occurring in the renal vessels.

To our knowledge, three cases of IVPG have been described so far. The characteristics of these literature cases and our case report can be seen in Table 1.

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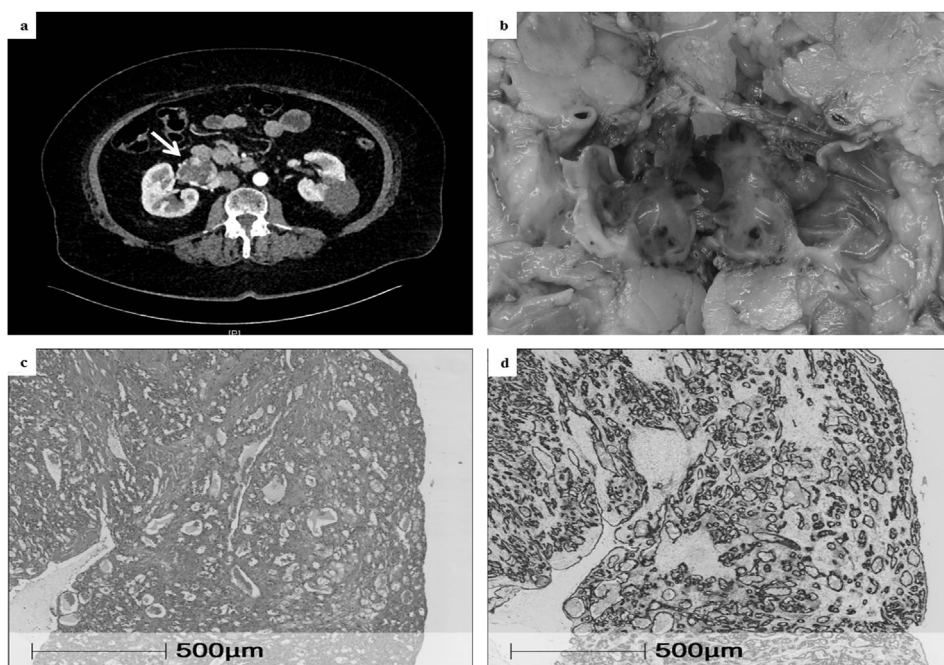


Fig. 1. (a) CT-imaging showed a 4.4 × 3.4cm heterogeneously enhancing mass anterior to the renal vein. On the other side, a cortical cyst classified Bosniak 2F was described. (b) Photo of the surgical specimen with partly solid, partly cystic appearance of grey-brown color. (c) Representative microscopic image from the surgical specimen (hematoxylin-eosin stain). (d) CD34-immunohistochemistry marking prominent endothelial cells. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

Table 1
clinical characteristics of the cases of IVPG in renal vessels described so far.

Age (years)	Gender (m/f)	Symptoms	Initial diagnosis	Maximum size (cm)	Therapy
73	m	none	sonography	2.5	radical nephrectomy (right side)
59	m	none	sonography	3	radical nephrectomy (right side)
36	f	epigastric pain	CT-scan	9.5	radical nephrectomy (left side)
78	f	none	sonography	2.9	radical nephrectomy (right side)

The median age of patients was 66 years. An equal gender distribution could be found. 3 of 4 patients were asymptomatic at the time of diagnosis. In one patient, unspecific epigastric pain for two months prior to diagnosis was reported. In 3 cases, IVPG was diagnosed during routine check-up of the upper urinary tract via sonography. Only in one case, CT-scan was performed as the primary diagnostic method. The average size of the tumors was 4.48 cm and in all cases radical nephrectomy was performed. All patients were discharged in good condition following recovery from surgery.

Discussion

Having reviewed the literature describing this tumor entity in renal vessels several points can be discussed.

Can a pre-resection biopsy avoid unnecessary surgery?

Imaging in patients with uncertain renal masses is state of the art and therefore offers the possibility to assess them preoperatively. Loftus et al. reviewed the imaging findings in a series of patients with IVPG and stated consistent ultrasound characteristics. As ultrasound is observer-dependent, and ultrasound characteristics were mostly observed in areas in close relation to the cutis (hand, head and neck) they are not fully applicable in a renal ultrasound setup.

*Concerning MRI, no consistent characteristics could be described.*⁵

Image-guided biopsy of renal lesions is an established method, widely used to differentiate between benign and malign masses. However, in IVPG originating in renal veins, biopsy should be seen critically, due to an increased risk of bleeding complications.

Nevertheless, in patients with low ECOG performance status or in those with a high risk of perioperative complications, a possible biopsy should be discussed. If all diagnostic criteria suggest IVPG, we suggest that active surveillance should be discussed as an option for asymptomatic patients.

Are there therapeutic alternatives?

Hull et al. proposed that small lesions could be treated with interventional embolization instead of surgery.⁴ This should be discussed especially in those patients with a high risk of perioperative complications having symptoms.

Therapeutically, it would be useful to know the dignity of a renal mass before possible resection. This can be achieved by pre-nephrectomy biopsy or with intraoperative frozen section analysis. If a benign tumor is identified, the surgical procedure of radical nephrectomy should be avoided. We suggest temporarily clamping the renal artery first, then the renal vein at the vena cava. We suggest this technique that is analogous to how a Vena Cava tumor-thrombectomy is routinely performed by many experienced urologists. The renal vein can then be incised and a biopsy performed. Alternatively, the intravascular lesion can be completely resected and send in for fresh-frozen-sectioning. Meanwhile, the vessel is closed and ischemia ended. This way, renal sparing surgery can be performed in benign lesions or completely resectable malignant lesion.

Conclusion

We report a case of IVPG originating from the renal vein. This rare and benign tumor has so far been described in three patients. We reviewed all cases and the relevant literature. Although in all published

cases of this entity radical nephrectomy was performed, it is yet unclear, if a pre-operative biopsy would be a diagnostic tool in the future to assess the need of a surgical approach. Especially in multi-morbid patients either an interventional approach or a wait-and-see tactic should be discussed. We also suggest an intraoperative algorithm for renal vessel masses.

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