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Laparoscopic treatment of adrenal cysts — own research and literature review

Leczenie laparoskopowe torbieli nadnerczy — materiał własny i przegląd piśmiennictwa

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Abstract

Material and methods: Over the last 18 months we operated on six patients with large adrenal gland cysts in our centre. This consisted of 8.2% of all patients treated in said period due to adrenal gland pathologies. On ruling out malignancy or parasitic nature of the lesions, all patients were surgically treated in order to excise the cysts while leaving the gland untouched. In five patients the cysts were resected but the adrenal gland was spared. However, in one patient the adrenal gland coated the entire cystic mass, which imposed performance of adrenalectomy in addition to cystectomy. During surgeries we tried not to clip the suprarenal vein, which we managed to do in four out of six cases.
Results: A one-year remote follow-up period revealed no cyst recurrence in ultrasound or CT, and it was possible to visualise the remaining part of the adrenal gland in all cases.
Conclusion: Thus, in our opinion resection of benign cysts is well justified and recommendable. **(Endokrynol Pol 2015; 66 (5): 469–472)**

Key words: *adrenal gland; adrenal cyst; adrenal tumours*

Streszczenie

Materiał i metody: W ciągu ostatnich 18 miesięcy autorzy pracy operowali 6 chorych z dużymi torbielami nadnerczy. Stanowi to 8,2% wszystkich chorych leczonych w tym okresie z powodu patologii w obrębie nadnerczy. Po wykluczeniu złośliwego i pasożytniczego charakteru patologii wszystkich chorych operowano z intencją wycięcia torbieli z oszczędzeniem samego gruczołu. U pięciu chorych resekowało samą torbiel z oszczędzeniem nadnercza, natomiast u jednego na ścianach torbieli opłaszczone było całe nadnercze, co zmusiło do adrenalektomii łącznie z cystektomią. W czasie operacji starano się też nie klipsować żyły nadnerczowej, co udało się w 4/6 przypadków.
Wyniki: Obserwacja odległa od 3 do 12 miesięcy nie wykazała nawrotu torbieli w obrazowaniu kontrolnym USG/CT. We wszystkich przypadkach udało się natomiast uwidocznić pozostawione nadnercze.
Wnioski: Autorzy uważają, że resekcja łagodnych torbieli jest postępowaniem uzasadnionym i godnym polecenia.
(Endokrynol Pol 2015; 66 (5): 469–472)

Słowa kluczowe: *nadnercza; torbiele nadnercza; guzy nadnerczy*

Introduction

Adrenal cysts are very rare diseases affecting 0.06–0.18% of the population in autopsy studies [1]. Computer analyses performed due to a variety of causes show pathological lesions in adrenal glands in ca. 5% of the examined population [2]. Cysts constitute 5.4% to 6.0% of all pathological changes affecting adrenal glands [3]. In about one-third of the cases, lesions are detected incidentally; in the remaining two-thirds cysts are symptomatic, which is typically related to their large size or rapid growth. In approximately 15% they are associated with a range of hormonally active pathological syndromes of the adrenal cortex and medulla [4].

There are five major histological cyst types: simple or endothelial cysts, true of epithelial cysts, pseudocysts, cysts not classified elsewhere, and parasitic cysts [4, 5]. Echinococcal cysts are quite rare — their incidence is estimated at 0.5% of all adrenal pseudocysts. Still, due to possible outcomes and complications they require special care in surgical treatment and preceding diagnostics [6]. Cysts may coexist with primary and metastatic adrenal tumours. Malignancy of the cyst is

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Table I. *Patient's data*
Tabela I. *Dane pacjentów*

Item no.	Patient/Sex/ Age	Side	Diameter in mm	Type of cyst	Clinical picture	Suprarenal vein	Type of surgery	USC/CT check
1.	SJ/K/29	L	10	Non-classified	Symptomatic	Yes	c.r. + p.a.g.r.*	Normal
2.	MK/K/34	L	6	Endothelial	Asymptomatic	No	c.r. + p.a.g.r.*	
3.	ChM/M/29	P	8	Endothelial	Symptomatic	Yes	adrenalectomy	
4.	MS/K/40	L	6	Lymphatic	Asymptomatic	No	c.r. + p.a.g.r.*	
5.	LA/M/64	P	12	Endothelial	Asymptomatic	No	c.r. + p.a.g.r.*	
6.	MJ/M/38	L	7	Endothelial	Asymptomatic	No	c.r. + p.a.g.r.*	

r. + p.a.g.r.; *cyst resection + partial adrenal gland resection

found in ca. 7% of all affected patients [7]. Parasitic and cancerous cysts require removal along with the entire adrenal gland, especially as current diagnostic imaging yields a high probability of characterising the lesion in the preoperative period and allows one to employ a suitable surgical approach [8]. In the case of other cysts, sparing treatment may be applied, such as marsupialisation or resecting the lesion only and leaving the adrenal gland untouched [9, 10]. The study presents the authors' own research material, which relates to laparoscopically treated adrenal cysts.

Material and methods

Eighty-three laparoscopic surgeries of adrenal glands were performed in our centre over the course of the last 18 months. These included six (8.2%) interventions due to adrenal cysts. All patients affected with adrenal cysts were laparoscopically treated in order to resect the lesion only. No cyst was associated with hormone overproduction or suspected of malignancy. In order to rule out the parasitic nature of the lesions, all patients were tested with the enzyme-linked immunosorbent assay (ELISA) and all had negative results. The table below is a compilation of all key data of the surgically treated patients and the descriptions of important clinical, histopathological, anatomical, and operative features of resected cysts (Table I).

Results

In five patients, cyst resection was performed leaving the entire or a part of the adrenal gland untouched, as intended. Following a thorough dissection of the largest possible area of cystic and adrenal walls, cystic contents were sucked up and cystic walls were subsequently resected at the borderline with the adrenal gland with a harmonic scalpel. Cystic wall haemorrhage required application of additional clips on more than one occasion.

Only in one case, the cyst was excised along the entire adrenal gland, as it was located centrally and its walls were coated with the gland.

When planning cyst resection we did not close the suprarenal vein either, except for one case when cyst wall resection required it to be cut due to its route. It is evident from the table above that in each surgically treated case our histopathologist found some small fragments of adrenal glands, even though in the course of surgeries it seemed as if we had left the adrenal gland untouched.

In our clinical material, asymptomatic adrenal cysts occurred twice as often as symptomatic ones. Nevertheless, it was not convincing enough because abdominal ultrasound was not always incidental. Still, in most cases it may not be related to the symptomatic adrenal cyst, all the more so because complaints are not specific.

Owing to studies reporting a possibility of cyst recurrence following surgical intervention in which the adrenal gland was spared, we performed follow-up ultrasound examinations and CT in the 12-month period after surgical treatment. During diagnostic imaging performed in all five treated patients we managed to visualise adrenal glands without cyst recurrence.

Baseline data and computer tomography results are presented in the following Figures 1–3.

Discussion

Adrenal cysts, despite their underlying nature, are highly uncommon. There are 600 cases accounted for in the publicly available literature until 2010. As our centre specialises in endocrine surgery, in the last 18 months we operated on as many as six patients with said pathology, which constitutes 8.2% of all patients who underwent surgical interventions due to adrenal

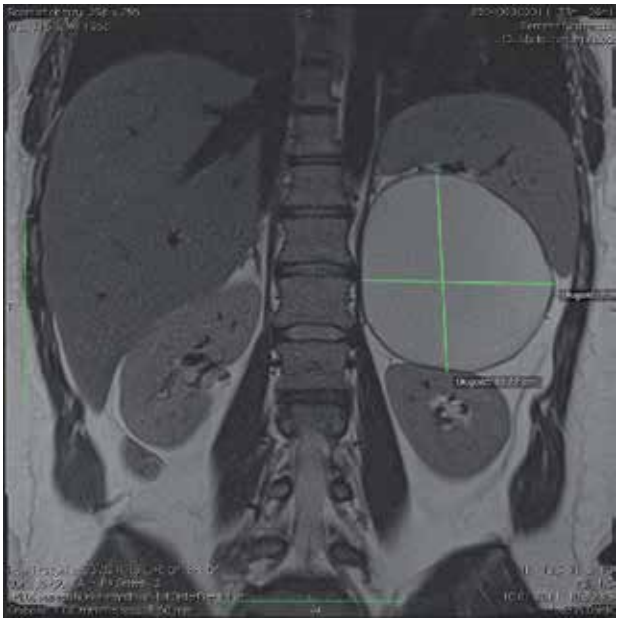

Figure 1. *Magnetic resonance imaging of adrenal cyst*
Rycina 1. *Rezonans magnetyczny obrazujący torbiel nadnercza*

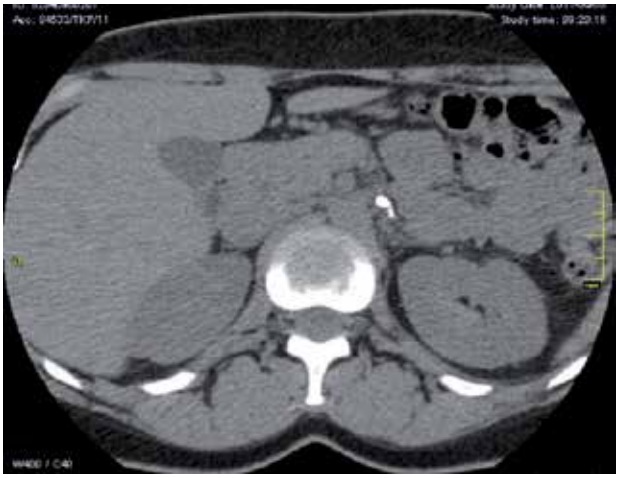

Figure 3. *Computed tomography check. View of clips and remaining adrenal glands*
Rycina 3. *Pooperacyjna tomografia komputerowa. Obraz klipsów i pozostałego gruczołu nadnercza*

pathologies. Data provided my Major et al. seem to be almost identical. This author reports 345 laparoscopic adrenalectomies in 28 patients with various cyst types [11]. Others observed adrenal cysts in 5 to 6 % of the population treated due to adrenal pathologies [3, 8].

Adrenocortical and adrenomedullar hyperfunction is accompanied by adrenal cysts in ca. 15% of cases. What is more, adrenal cysts accompany approximately 7% of primary and metastatic cancerous processes, and in 0.5% of cases they are of parasitic origin [4, 6, 12]. Hence, each surgical intervention should include an individual differential diagnosis. The following

Figure 2. *Postoperative excised cyst specimen*
Rycina 2. *Materiał pooperacyjny*

diagnostic imaging analyses are key to finding lesions within adrenal glands and allow for description of pathologic lesions in ca. 95% of cases: ultrasound, computed tomography, magnetic resonance imaging, positron emission tomography [8]. The ELISA test allows one to rule out echinococcal origins of the cyst, while fine-needle biopsy enables cytological evaluation with up to 85% sensitivity as far as malignant changes are concerned [3]. Adrenal secretion assessment is performed every time with the application of generally available laboratory tests.

From the point of view of the surgeon, the method of surgical intervention in the case of adrenal glands is becoming a major issue because in three-fourths of cases it is not completely evident whether or not the cyst should be removed along the entire adrenal gland. Along with the development of minimally invasive laparoscopic techniques, there are reports of effective adrenal cyst treatment sparing the adrenal gland itself.

In such cases, Neri et al. suggest cyst puncture and fluid aspiration only, and in the case of recurrence they suggest reaspiration. The author recommends surgical interventions only for persistent recurrences. Aspiring fluid from the cyst allows additional cytological diagnostics to be performed [13].

There is more and more information regarding laparoscopic adrenal cyst resections sparing the adrenal gland in the latest literature. One needs to bear in mind that almost all cyst excisions may involve a partial adrenalectomy, which may be impossible to recognise at the time of surgery and is confirmed by a histopathologist [14, 15]. When qualifying their patients for sparing operations, the authors tried not to clip the suprarenal vein. We performed a thorough resection of the cystic wall with a harmonic scalpel and left the adrenal gland as unaffected as possible.

However, cysts concomitant to hormonally active changes in the adrenal gland and bacterial and parasitic cysts require a more radical procedure.

Such patients are most often qualified for a classical adrenalectomy in addition to cystectomy due to the necessity of removing the entire cyst, without its intraoperative voiding [16]. Rapidly growing symptomatic cysts and haemorrhagic cysts related to adrenal cortex and medulla diseases are yet another problem. When hormonal overproduction occurs in adrenal glands patients necessitate a precise differential diagnosis and a comprehensive preparation for surgical treatment, especially in the case of phaeochromocytoma.

Conclusions

Under such circumstances most authors advocate open adrenalectomy to accompany cystectomy [1, 4, 17, 18].

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