Adrenal Surgery for Cushing’s Syndrome: An Update.
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Recent advances in the molecular pathogenesis and the natural history of Cushing’s syndrome have improved the understanding of the management of this disease. The long-term efficacy of several cortisol-lowering medical treatments is currently under evaluation. However, adrenalectomy is a safe option for the treatment of patients affected by Cushing’s syndrome. Unilateral adrenalectomy is the gold standard for treatment of adrenocortical adenomas associated with hypercortisolism. Bilateral adrenalectomy has been widely used in the past as definitive treatment of bilateral micronodular hyperplasia and persistent or recurrent Cushing’s disease. The indication and the potential applications of this technique have been recently critically analyzed.

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Surgical management of large adrenal tumors: impact of different laparoscopic approaches and resection methods on perioperative and long-term outcomes.
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BACKGROUND: The indication of retroperitoneal laparoscopic adrenalectomy (RLA) was extended with the retroperitoneal approach and has been wildly accepted and technologically matured. However, the management of large adrenal tumors via this approach still remains controversial. The aim of this study was to perform a comprehensive analysis on the minimally invasive surgical management of larger adrenal tumors.

METHODS: A total of 78 patients with large adrenal tumors (> 5 cm) and 97 patients with smaller adrenal tumors (< 5 cm) were enrolled in this study. The patient characteristics were preferentially analyzed. The intra-operative and postoperative indicators were compared between those who underwent RLA and those who underwent transperitoneal laparoscopic adrenalectomy (TLA); the intra-operative and postoperative indicators were also compared between the large tumor group and smaller tumor group of those who underwent RLA. Furthermore, the analyses of partial RLA were focused on the perioperative indicators and
follow-up results.

RESULTS: RLA was superior to TLA in terms of operation time (98.71 ± 32.30 min vs. 124.36 ± 34.62 min, respectively, P = 0.001), hospitalization duration (7.43 ± 2.82 days vs. 8.91 ± 3.40 days, respectively, P = 0.04), duration of drain (4.83 ± 0.37 days vs. 3.94 ± 2.21 days, respectively, P = 0.02), first oral intake (2.82 ± 0.71 days vs. 1.90 ± 0.83 days, respectively, P < 0.001) and time to ambulation (3.89 ± 1.64 days vs. 2.61 ± 1.42 days, respectively, P < 0.001). Further analyses of the RLA patients demonstrated that the larger tumor (> 5 cm) group showed superior results for the intraoperative indicators than the smaller tumor (< 5 cm) group (P < 0.05), while the results for the postoperative indicators between the two tumor size groups were similar (P > 0.05). Data confirmed that the partial resection method was superior to the total resection method from the perspective of the hormone supplement (0% vs. 48.15%, P = 0.002). The 2-year recurrence-free rates were 92.60 and 92.86% for the total and partial RLA resection methods, respectively (P = 0.97). The partial RLA resection method had a similar complete remission rate as the total RLA resection method (96.30% vs. 100%, respectively, P = 0.47).

CONCLUSION: Both RLA and TLA seem to provide similar effects for the surgical management of large adrenal tumors. However, partial RLA resection should be considered for the management of benign tumors to reduce the hormone supplement.

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Contralateral adrenal width predicts the duration of prolonged post-surgical steroid replacement for subclinical Cushing syndrome.

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OBJECTIVES: To identify pre-treatment factors affecting the duration of post-surgical steroid replacement in patients undergoing adrenalectomy for subclinical Cushing syndrome.

METHODS: The present retrospective analysis included 64 patients who underwent unilateral laparoscopic adrenalectomy for subclinical Cushing syndrome. Adrenal tumor and contralateral adrenal sizes together with various clinical factors were studied in association with the duration of post-surgical steroid replacement. Adrenal tumor and contralateral adrenal size were measured at the level of the maximum transverse plane of the adrenal glands using computed tomography scan or magnetic resonance imaging. Cox's proportional hazards model was used for the statistical analysis.

RESULTS: All 64 patients were treated with post-surgical steroid replacement after adrenalectomy. The median duration of the steroid treatment was 6 months. When assessing the duration of post-surgical steroid replacement, contralateral
adrenal volume <0.745 cm³, contralateral adrenal width <6.15 mm and serum cortisol after a 1-mg dexamethasone suppression test >2.65 μg/dL were significant predictors of prolonged post-surgical steroid treatment on univariate analysis. On multivariate analysis, contralateral adrenal width <6.15 mm was the only independent predictive factor for the prolonged post-surgical steroid replacement.

CONCLUSIONS: Contralateral adrenal width seems to represent a significant predictive factor for the duration of post-surgical steroid replacement in subclinical Cushing syndrome patients. Pre-surgical assessment of image findings might help clinicians determine the total duration of steroid therapy after adrenalectomy.

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Characteristics of Female Genital Restoration Surgery for Congenital Adrenal Hyperplasia Using a Large-scale Administrative Database.
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OBJECTIVE: To analyze nationwide information on the timing of surgical procedures, cost of surgery, hospital length of stay following surgery, and surgical complications of female genital restoration surgery (FGRS) in females with congenital adrenal hyperplasia (CAH).
MATERIALS AND METHODS: We used the Pediatric Health Information System database to identify patients with CAH who underwent their initial FGRS in 2004-2014. These patients were identified by an International Classification of Diseases, Ninth Revision (ICD-9) diagnosis code for adrenogenital disorders (255.2) in addition to a vaginal ICD-9 procedure code (70.x, excluding vaginoscopy only) or perineal ICD-9 procedure code (71.x), which includes clitoral operations (71.4).
RESULTS: A total of 544 (11.8%) females underwent FGRS between 2004 and 2014. Median age at initial surgery was 9.9 months (interquartile range 6.8-19.1 months). Ninety-two percent underwent a vaginal procedure, 48% underwent a clitoral procedure, and 85% underwent a perineal procedure (non-clitoral). The mean length of stay was 2.5 days (standard deviation 2.5 days). The mean cost of care was $12,258 (median $9,558). Thirty-day readmission rate was 13.8%. Two percent underwent reoperation before discharge, and 1 (0.2%) was readmitted for a reoperation within 30 days. Four percent had a perioperative surgical complication.
CONCLUSION: Overall, 12% of girls with CAH underwent FGRS at one of a national
collaborative of freestanding children's hospitals. The majority underwent a vaginoplasty as a part of their initial FGRS for CAH. Clitoroplasty was performed on less than half the patients. Overall, FGRS for CAH is performed at a median age of 10 months and has low 30-day complication and immediate reoperation rates.

MANAGEMENT OF ENDOCRINE DISEASE: Adrenocortical carcinoma: differentiating the good from the poor prognosis tumors.
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Adrenocortical carcinoma (ACC) is a rare malignancy with a poor prognosis, the five-years overall survival being below 40%. However, there is great variability of outcomes and we have now a better view of the heterogeneity of tumor aggressiveness. The extent of the disease at the time of diagnosis, best assayed by the European Network for the Study of Adrenal Tumors (ENSAT) Staging Score, is a major determinant of survival. The tumor grade, including the mitotic count and the Ki67 proliferation index, also appears as a strong prognostic factor. The assessment of tumor grade, even by expert pathologists, still suffers from inter-observer reproducibility. The emergence of genomics in the last decade has revolutionized the knowledge of molecular biology and genetics of cancers. In ACC, genomic approaches - including pan-genomic studies of gene expression (transcriptome), recurrent mutations (exome or whole-genome sequencing), chromosome alterations, DNA methylation (methylome), miRNA expression (miRnome) - converge in a new classification of ACC, characterized by distinct molecular profiles and very different outcomes. Targeted measurements of a few discriminant molecular alterations have been developed in the perspective of clinical routine, and thus, may help defining therapeutic strategy. By individualizing patients' prognosis and tumor biology, these recent progresses appear as an important step forward towards precision medicine.

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Application of strict criteria in adrenal venous sampling increases the
OBJECTIVES: Adrenal vein sampling (AVS) is intended to confirm unilateral forms of primary aldosteronism, which are amenable to surgical cure. Excessively strict AVS criteria to define lateralization may result in many patients incorrectly categorized as bilateral primary aldosteronism and opportunity for surgical cure missed.

METHODS: Retrospective review of an AVS-primary aldosteronism database in which surgical cases are verified by standardized outcomes. Having used 'less strict' AVS criteria for lateralization, we examined the distribution of AVS lateralization indices in our confirmed unilateral primary aldosteronism cases both with and without cosyntropin stimulation. The proportion of proven unilateral cases that would have been missed with stricter AVS interpretation criteria was calculated. Particular focus was given to the proportion of missed cases according to use of international guidelines. False-positive lateralization with 'less strict' interpretation was also calculated.

RESULTS: Of 80 surgical primary aldosteronism cases, 10-23% would have been missed with AVS lateralization indices of 3:1 to 5:1, with or without cosyntropin. If strict selectivity indices (for confirmation of catheterization) were combined with strict lateralization indices, up to 70% of unilateral primary aldosteronism cases could have been missed. Use of Endocrine Society AVS guidelines would have missed 21-43% of proven unilateral cases. 'Less strict' AVS interpretation yielded one case (1.2%) of false lateralization.

CONCLUSION: Excessively strict AVS interpretation criteria will result in a high rate of missed unilateral primary aldosteronism with subsequent loss of opportunity for intervention. Use of more lenient lateralization criteria will improve the detection rate of unilateral primary aldosteronism with very low false-positive rate.

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OBJECTIVE: The imaging-guided percutaneous radiofrequency (RF) ablation of adrenal metastases is a relatively new treatment procedure, compared to the more widespread application of the technique for the treatment of liver and renal cancers. The present study aims to evaluate the safety and efficacy of the CT-guided percutaneous RF ablation of adrenal metastases in a cohort of patients.

METHODS: 33 patients with 38 adrenal metastases who received percutaneous CT-guided RF ablation between 2012 to 2015 were retrospectively reviewed. The average diameter of the treated adrenal metastases was 3.0 ± 1.6 cm. The treatment outcomes, including presence of residual tumours, technical success rate, recurrence rate, and complications, were evaluated. Patients were followed up for every 3 months to monitor the progression of the disease.

RESULTS: Postoperative CT images showed the lack of tumour enhancement in 30 tumours (30/38 tumours, technical success rate = 78.9%), and residual disease was found in 7 tumours (7/37 tumours, 18.9%). The rate of residual disease was significantly lower in the group with tumour size <3 cm than the group with tumour size ≥3 cm (p = 0.025). The severe complication rate was 4.3%, and the mild complication rate was 48%, with intraoperative hypertensive crisis as the most frequently observed complication (27.3%). The follow-up data showed that 76.3% of patients had recurrence-free survival in 27.4 months.

CONCLUSION: The current study demonstrated that radiofrequency ablation is a relatively safe and effective treatment for controlling adrenal metastases, especially for patients with tumour size <3 cm. Advances in knowledge: Surgical resection of the adrenal metastases was advocated as one of the treatment options for patients. The present study showed that radiofrequency ablation is a relatively safe and effective treatment for controlling adrenal metastases.

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