

AB082. SOH21AS180. A radiomic model to classify adrenal lesions on CT

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Background: Medical imaging analysis has evolved to facilitate the development of AI-enhanced methods for high-throughput extraction of quantitative features that can potentially contribute to the diagnostic and treatment paradigm of adrenal pathology. Adrenal lesions can be classified as benign/malignant or originating in the cortex/medulla. Qualitative radiological features can contribute to diagnosis however histopathological assessment is required to definitively establish the type of lesion. There is a need for non-invasive diagnostic markers due to the impracticality of adrenal biopsy. The aim of this study was to develop and validate a radiomic classifier to non-invasively classify adrenal lesions on CT.

Methods: Data on patients who underwent adrenalectomy from 2009–2020 was included. Tumour segmentation was carried out manually under the supervision of a consultant radiologist. Radiomic features were extracted using LIFExTM software. Features were selected using a random forest and support vector machine (SVM) learning approach. The radiomic classifier was built using a least absolute shrinkage selection operator (LASSO) regression.

Results: Ninety-six patients were included in the study (aged 53±5 years). Seventy-eight patients underwent minimally invasive retroperitoneoscopic surgery and 18 had open surgery. Mean lesion size was 42 mm. There were

72 benign lesions and 8 malignant lesions. 50 patients had adreno-cortical lesions while 25 had medullary lesions. 5 Radiomic features in combination were able to differentiate benign *vs.* malignant and cortical *vs.* medullary lesions respectively (AUC <0.8, AUC <0.75).

Conclusions: This study validated a radiomic classifier to non-invasively predict the malignant status and zone of origin of adrenal lesions.

Keywords: Adrenal surgery; radiomics; CT; pheochromocytoma; adenoma

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Footnote

Conflicts of Interest: AL serves as an unpaid editorial board member of *Mesentery and Peritoneum*. The other authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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