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IMAGING INSIGHTS INTO A RARE ENTITY: ADRENAL TERATOMA

Radio-Diagnosis

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ABSTRACT

Primary adrenal teratomas are exceptionally rare germ cell tumors, often presenting as heterogeneous masses containing fat, calcifications, and proteinaceous material. This report highlights a case of a 22-year-old female presenting with right upper quadrant pain and an abdominal mass. Imaging studies revealed a mixed-density lesion on CT with fat and coarse calcifications and no post-contrast enhancement. MRI confirmed the findings with multiseptated T1 and T2 hyperintense areas, macroscopic fat suppression, and diffusion restriction in solid components. Histopathology confirmed a mature teratoma. This case emphasizes the critical role of imaging, particularly CT and MRI, in identifying adrenal teratomas and guiding surgical intervention, which significantly improves prognosis. Early diagnosis is pivotal for preventing complications and ensuring favorable outcomes.

KEYWORDS

Adrenal teratoma, CT, MRI

INTRODUCTION

Primary adrenal teratoma is a rare type of tumor, categorized under germ cell tumors. These tumors originate from pluripotent cells, which possess the ability to differentiate into multiple types of somatic cells. Teratomas commonly contain components from more than one embryonic germ cell layer, predominantly ectodermal elements, with endodermal elements being the least frequent. This composition can include diverse tissues such as skin, hair, teeth, neural tissue, fat, and cartilage.

Based on the degree of tissue differentiation, teratomas are classified as either mature or immature. Mature teratomas, which often include components from all three germ layers, are generally benign and have low malignant potential. In contrast, immature teratomas contain less differentiated tissues and carry a higher risk of malignancy.

Teratomas outside the gonads are uncommon, with adrenal teratomas being exceedingly rare. These tumors primarily affect neonates and adolescents and show a higher prevalence in females.

Case History

A 24-year-old female presented with pain, and discomfort in the right upper quadrant of the abdomen for the last two months and a mass in the same region for the last 1 month. There is no history of fever or vomiting. No history of any urinary complaints. On palpation, there was a vague lump in the right hypochondrium.

The results of complete blood counts and routine biochemical assessment, including kidney and liver function tests were unremarkable.

Routine and microscopic urine examination revealed no abnormality. Urinary vanillylmandelic acid was within normal limits. On ultrasonography, a well-marginated mass with heterogenous echotexture was seen in the right suprarenal region with dense internal calcification.

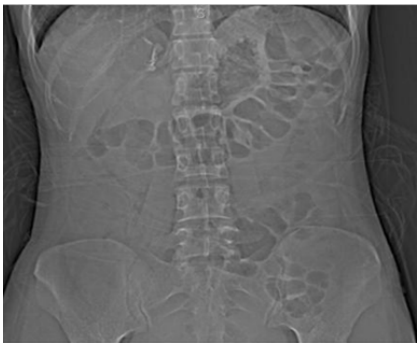
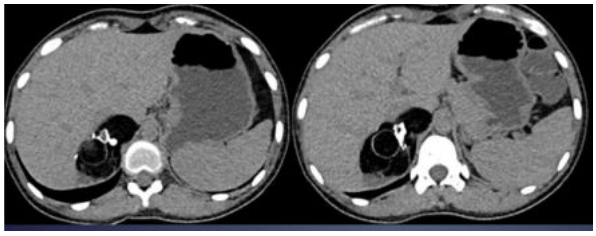


Fig1:- Topogram shows a bone like calcification just superior to right renal shadow adjacent to T12 vertebral body.

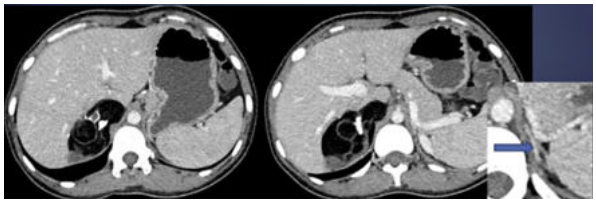
Imaging Findings

Image 1)



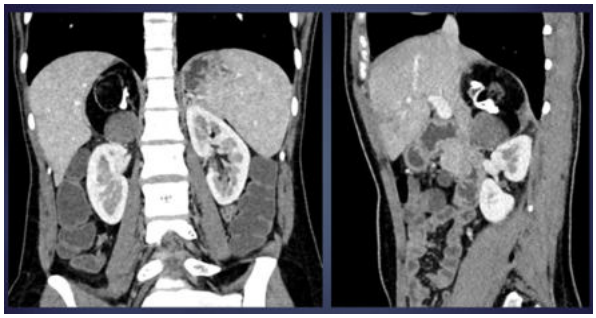
NCCT shows a mixed density, predominantly fat containing lesion in right suprarenal region with right adrenal gland not visualized separately. Lesion contains bone like coarse amorphous calcification, showing cortical and medullary differentiation, and an eccentric solid component.

Image 2)



CECT shows no abnormal enhancement. Left adrenal gland is visualized separately and is normal (arrow).

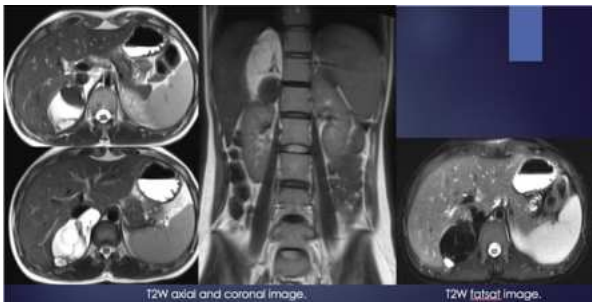
Image 3)



CECT coronal and sagittal reformatted images show right suprarenal location of the mass indenting the liver, having solid and fat

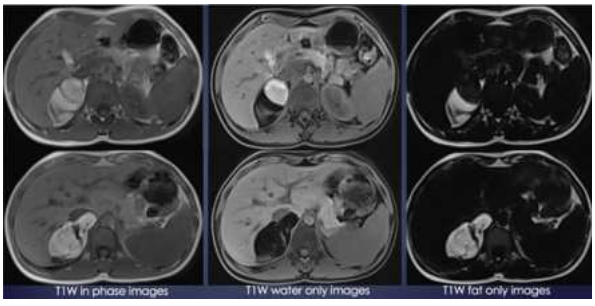
components with coarse calcification.

Image 4)



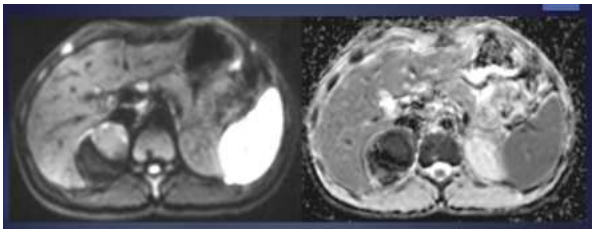
T2 axial & coronal images show mixed signal intensity solid cystic multiseptated mass. The T2 hyperintensity shows suppression on T2fatsat images s/o macroscopic fat. A small cystic component noted in posterior aspect.

Image 5)



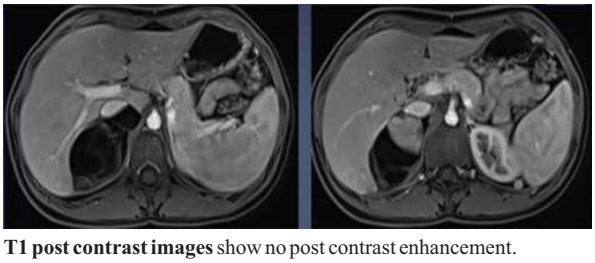
T1W images show T1 hyperintense component with signal drop on fat suppressed images s/o fat. Another T1 hyperintense component with high signal on water only images s/o proteinaceous content.

Image 6)



Diffusion weighted image and ADC map shows diffusion restriction in the solid component.

Image 7)



T1 post contrast images show no post contrast enhancement.

DISCUSSION

CECT showed a predominantly fat-containing lesion in the right suprarenal location with solid, cystic areas, proteinaceous content, and coarse amorphous calcification. The right adrenal gland is not visualized.

MRI showed a mixed signal intensity lesion in the corresponding location with areas of macroscopic fat (TI/T2 hyperintensity with a signal drop on fat-suppressed sequences) and coarse calcification.

Diffusion restriction in the solid component. No enhancement in the post-contrast study.

Histopathology showed cysts lined by stratified squamous epithelium containing keratin flakes. Areas showed mature adipose tissue with few areas showing ganglion cells, hematopoietic marrow, cartilage, and calcification. No immature component was seen.

Features Are Consistent With Mature Teratoma.

CONCLUSION

Primary adrenal teratomas are rare and often present as heterogeneous masses containing components of fat, fluid, and calcification on imaging. Both CT and MRI are instrumental in identifying these tumors, which can include areas of fat, proteinaceous content, and calcification. Early surgical intervention is crucial, as it significantly improves the prognosis, with 5-year survival rates approaching 100%. Prompt diagnosis and management are essential to prevent complications and ensure optimal patient outcome

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