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PREVALENCE OF CYSTIC LESIONS IN PARENCHYMAL ABDOMINAL ORGANS

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ABSTRACT

Introduction: Abdominal cystic lesions can be localized either in parenchymal or non-parenchymal organs and can be acquired or congenital. Knowing the characteristic imaging features as well as demographic data and the prevalence of cystic lesions can help radiologists in establishing the correct diagnosis. In this article, we conducted a statistical study of congenital and acquired cystic lesions of the abdomen, diagnosed by CT scan in patients hospitalized in Emergency Clinical County Hospital of Constanţa in years 2019 - 2020.

Material and methods: The retrospective study included 285 patients admitted to the hospital. In the case of each patient, we recorded the following variables: Age, Sex, Localization of the lesion, Types of cysts for each localization.

Results: The average age of the patients is 61.53 years. Most of the cystic lesions were localized in the liver (182 cases) and they were represented by: hydatid cysts, simple hepatic cysts, hepatic abscess, hepato-renal polycystic disease and hepatic adenocarcinoma. Cystic lesions of the kidney (56 cases) were represented by: autosomal dominant polycystic kidney disease, renal carcinoma, simple renal cysts, acquired polycystic renal disease, tuberous sclerosis, clear cell renal carcinoma and von Hippel Lindau syndrome. Cystic lesions of pancreas (47 cases) were represented by: pancreatic cysts, pancreatic pseudocysts and pancreatic adenocarcinoma.

Conclusions: CT examination is extremely useful in establishing the location, type, imaging characteristics of cystic lesions, echo over surrounding organs, possibility of malignant transformation. The prevalence of certain types of localizations and morphologies depending on the age and organ involved always helps to obtain a correct and rapid diagnosis.

Keywords: CT, renal cyst, hepatic cyst, pancreatic cyst

Introduction

Abdominal cystic lesions can be localized either in parenchymal or nonparenchymal organs and can be acquired or congenital (1). The organ of origin, specific imaging findings and the position of the cystic lesion are useful in differential diagnosis. Ultrasonography (US), magnetic resonance imaging (MRI) and computed tomography (CT) can be used for imaging diagnosis, all of which have advantages and disadvantages.

Ultrasonography, which is less expensive and widely available, is usually preferred in paediatric patients due to its lack of ionizing radiation and to the opportunity of real-time imaging, but it is highly dependent on the operator.

MRI and CT are indeed useful to determine anatomical relationships with adjoining organs. Moreover, the internal content of the cystic structures could be effectively assessed with these types of investigation. They can also be used for follow-up in case of injuries that have a potential risk of malignant transformation.

One of the main advantages of CT in comparison with MRI is the possibility of rapid

available image, especially with uncooperative patients. MRI that provides a high resolution of soft tissues, is preferred for follow-ups, especially in young patients, due to the lack of ionizing radiation.

Knowing the typical imaging aspects as well as demographic data and the prevalence of cystic lesions can help radiologists in establishing the correct diagnosis. Like this, in turn, the radiologist can provide the clinician with valuable information to establish further therapeutic management.

In this article, we conducted a statistical study of congenital and acquired cystic lesions of the abdomen, diagnosed by CT scan in patients hospitalized in Emergency Clinical County Hospital of Constanta in years 2019 - 2020.

Material and method

The retrospective study included 285 patients admitted to the Emergency Clinical County Hospital of Constanta in 2019 – 2020. In the case of each patient, we recorded the following variables:

- Age
- Sex
- Localization of the lesion
- Types of cysts for each localization

Results

In terms of gender distribution, 163 patients were males and the remaining 122 cases were females (figure 1).

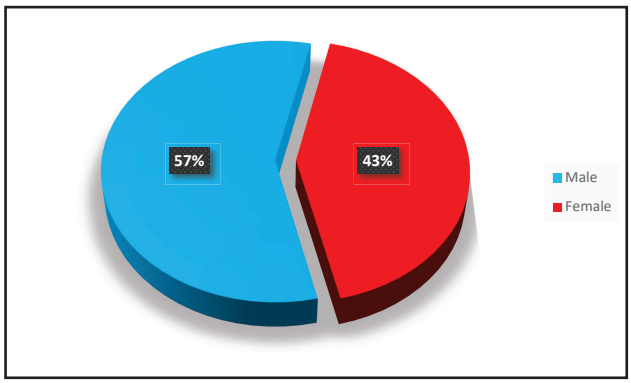

Figure 1. Gender distribution of patients in the studied group

It was noticed that most of the cysts were localized in the liver, and the liver and kidney cysts together accounted for 83.51% of the cases.

Of the 285 cases, 182 (63.86%) had liver cysts, 56 (19.65%) kidney cysts and 47 (16.49%) had pancreatic cysts (figure 2).

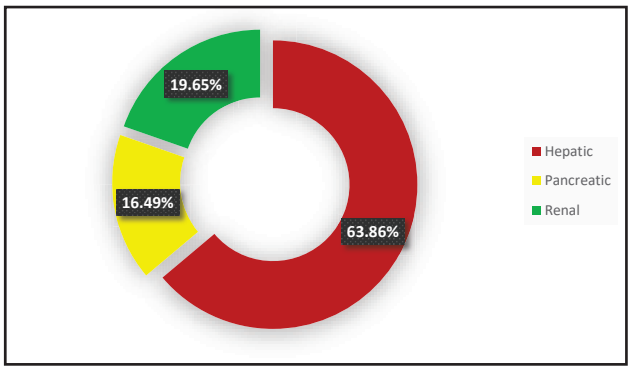

Figure 2. Localization of cystic lesions

Of the 182 cases of hepatic cystic lesions, most of them (81 cases) were hydatid cysts followed by 39 cases of simple hepatic cysts, 39 cases of hepatic abscess, 22 cases of hepato-renal polycystic disease and 1 case of hepatic adenocarcinoma (figure 3).

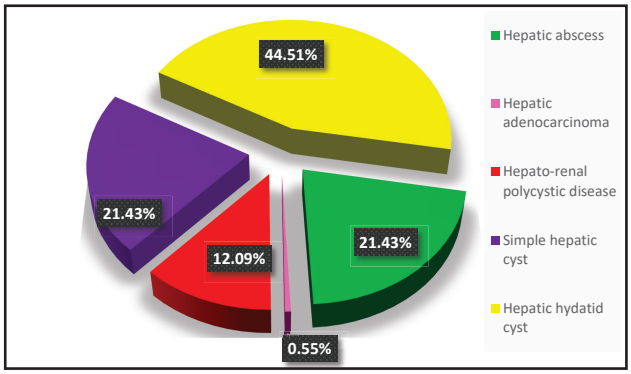

Figure 3. Types of liver cystic lesions

Out of the 56 cases of kidney cystic lesions, 17 cases were diagnosed with autosomal dominant polycystic kidney disease, 15 cases had renal carcinoma, 11 cases with simple renal cysts, 4 cases had acquired polycystic renal disease, 4 cases with tuberous sclerosis, 3 cases had clear cell renal carcinoma and 2 cases with von Hippel Lindau syndrome. Most of the cysts were located at the cortical level, in the vicinity of the renal pelvis, and in cases of polycystic disease we noticed multiple cysts with different localizations (figure 4).

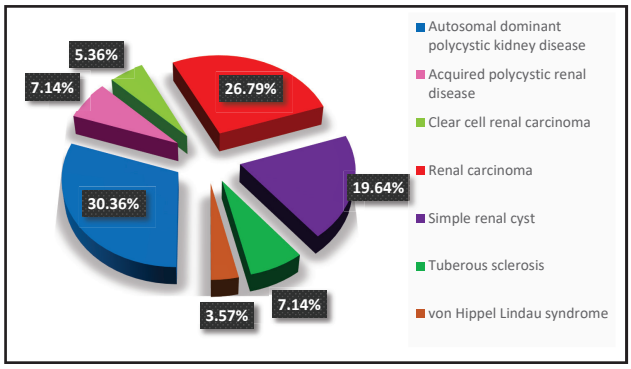

Figure 4. Types of kidney cystic lesions

As for the 47 cases of pancreatic cystic lesions, 24 patients had pancreatic cysts, 22 had pancreatic pseudocyst and 1 case had pancreatic adenocarcinoma. Most affected areas of pancreas were the tail and the body of the organ (figure 5).

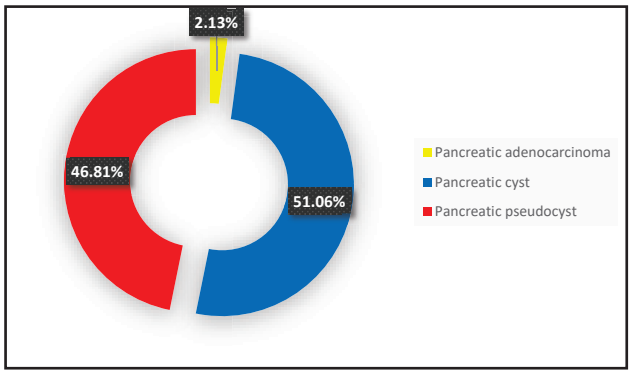

Figure 5. Types of pancreas cystic lesions

Discussion

The first step in diagnosing abdominal cystic lesions is to establish their location: either in a parenchymal organ or in the omental or mesenteric structures. In the abdominal parenchymal organs, lesions such as simple or complex cysts, cystic neoplasms and abscesses can be frequently identified. One could observe differences between paediatric and adult age groups in the evaluation of the cystic abdominal masses. (2-6).

CT examination is frequently used in the assessment of cystic abdominal lesions. Bosniak et al., in many of their studies, classified kidney cysts by CT scan and have established the criteria for determining malignancy (7-9). By CT examination, one can obtain details that delineate the basic traits of the cystic mass, essentially the internal structure of the cystic lesion, the presence of solid components, the wall structure and the presence of calcifications. Moreover, details about the content of the cystic lesion can be provided by measuring the density. Simple cysts have water density, and the density measurement values is less than 20 Hounsfield units (HU); but, in case a cystic lesion has a higher density, intracystic haemorrhage or high protein content are taken into account (10-11).

Nazli's & assoc. study (published in 2021) included a total of 145 cases of patients with cysts located in the abdominal cavity. In this study, the lesions were localized in the kidneys in 68 patients (46,8%), in the liver in 65 cases (44,8%), in the pancreas in 7 cases (4%), in the spleen in 5 cases (3%), and extra-parenchymatous lesions in the abdominal cavity were diagnosed in 5 cases (3%) (2).

As with our study, cysts were most commonly localized in the liver and second in the kidneys. This pattern was observed both in the year 2019 and in 2020. The result is explicable because our cases were generally elderly patients (average age of 61.53 years) and patients diagnosed with hepato-renal polycystic disease were statistically recorded in the group of patients with cystic liver diseases.

Hydatid cysts are usually located in the liver (75%), and less often in the lungs (15%), spleen, brain, kidneys or bones (7,13-18). In our cases, the hydatid cysts ranked first place, with 81 cases, of all lesions localized in the liver.

The second most common location of cystic abdominal lesions is within the kidney. As observed in many studies, over 50% of simple kidney cysts develop in the population over 50 years of age and the percentages increase with age (19,20). Kidney cysts can be simple cortical cysts, kidney abscesses, parapelvic cysts, hydatid cysts, calyx diverticula, and cysts that occur in cases of chronic dialysis (19). Moreover, reports show that acquired cysts develop in all cases of end-stage chronic dialysis. More than 90% of kidney cysts develop within 5 years after the initiation of renal dialysis.

The incidence for kidney cancer from these cysts is 5-20% (20). According to Levine et al 7% of these cases developed renal cell carcinoma (21). In our study, 32.15% patients had malignant

cystic lesions.

It is highly important to differentiate complicated benign and malignant kidney cysts. Septation of the cyst, the appearance of calcification, thickening of the wall, heterogeneous appearance and the presence of a solid component in the cyst are all signs of malignant transformation (13). One can use the Bosniak classification for the evaluation of complicated kidney cysts.

CT scan is the primary non-invasive imaging method used for the diagnosis of pancreatic pathologies (18). In the study of Nazli (2), cysts localized in the pancreas were reported in 7 cases (3,44%). In comparison, in our study, pancreatic cystic lesions accounted for a larger percentage from which pancreatic cysts and pseudocysts represented 97.87% and 2.13% was represented by pancreatic adenocarcinoma. Most of our cases consisted of pancreatic cysts and pseudocysts, which developed after acute and chronic pancreatitis and appeared as wall-less collections on CT. Pseudocysts are cystic lesions that do not have a true wall delineated by epithelium, which is formed as a result of limited fluid collections with surrounding granulation tissue. Acute liquid collections develop in about 30-50% of cases, but for half of them, the collections spontaneously regress, and the formation of the pseudocyst can be observed in the rest of the cases within 4-6 weeks (22-27).

Conclusions

Congenital and acquired cystic lesions of the abdomen are often found in radiological practice. They can be diagnosed by chance or give rise to symptoms that cause the patient to turn to the doctor. Proper diagnosis is essential, since they can disguise several other acquired benign or malignant diseases of the abdomen. For each type there are different treatment approaches and prognostic implications. With the appropriate and correct use of imaging, as well as with relevant clinical information about the patient's history, the diagnosis can be relatively simple, and the clinical management can be initiated and conducted properly.

CT examination is extremely useful in establishing the location, type, imaging characteristics of cystic lesion, echo over surrounding organs, and possibility of malignant transformation. The prevalence of certain types of localizations and morphologies depending on the age and organ involved always helps to obtain a correct and rapid diagnosis.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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