Open Access Journal

Indian Journal of Medical Research and Pharmaceutical Sciences

January 2021;8(1) ISSN: ISSN: 2349-5340

DOI: https://doi.org/10.29121/ijmrps.v8.i1.2020.1 Impact Factor: 4.054

THE ROLE OF COMPUTED TOMOGRAPHY (CT) IN PATIENTS WITH RIGHT ILIAC FOSSA PAIN IN THE EMERGENCY DEPARTMENT

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Keywords: *Right iliac fossa pain, computed tomography (CT).*

Abstract

Objective

To emphasize the accuracy of CT as non-invasive method either to confirm specific diagnosis or suggest an alternative diagnosis for right iliac fossa pain.

Material and method

A total number of 200 patients who underwent abdomen and pelvic CT, their images were retrospectively reviewed in a period between June 2019 –December 2019 at King Hussein Medical Center. The age of the patients ranges from (14-70 years) with the mean age 42 years. All scans were performed with Siemens definition dual source 64 slice CT scan, abdominal CT scan protocol with or without intravenous (IV) contrast media administration.

The results will be analyzed by simple statistical method.

Introduction

Abdominal pain is a common problem of consultation in hospitals, and right iliac fossa (RIF) pain is one of the most frequent conditions that treated in the emergency department and by the
general surgery service (1). One of the obstacles that face the clinicians in treating the patients with right iliac fossa pain is the wide range of differential diagnoses in addition to the non-specific presentations that create a diagnostic challenge. To solve this dilemma, the imaging modalities such as multidetector CT scan (MDCT) play an important role in the diagnosis and guidance to the proper management. In general, the main advantages of MDCT include short scan time, high quality of images and higher accuracy than Ultrasound in obese patients and gaseous abdomen. While the main two disadvantages are the exposure to ionizing radiation and the risk of contrast reaction when intravenous contrast is administrated. The scanning technique has varied between studies with some using no contrast agents and others using one or more of oral, intravenous, and rectal contrast (2). Appendicitis and its complications are the most common cause of abdominal pain that surgically managed (3). Recently the MDCT exceeds its use in the diagnosis of appendicitis and its mimickers with high sensitivity and specificity.

Materials and methods

This is a retrospective study for two hundred patients who presented with the complaint of right iliac fossa pain in the emergency department at king Hussein medical center within 6 months period (June 2019-December 2019). The age of the patients was between 14 and 70 years. These patients underwent MDCT for confirmation with exclusion the patients who had recent history of abdominal surgery. All patients were scanned with 64 slice dual source Siemens scanner. The images involved abdomen and pelvic CT without or with IV contrast (portal venous phase) and the parameters were: axial cuts at 5mm and 3mm slice thickness, reformatted images in coronal and sagittal plane using 3mm slice thickness with (60-100) MAs and 120 KVP. Our study obtained an ethical committee approval from our institution.

Result

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The investigations for right ilia fossa pain in the emergency department included the clinical assessment, the laboratory tests and abdominal Ultrasound. When the findings of the mentioned workup were not conclusive, the patients underwent MDCT for diagnosis. The images were reviewed by two senior radiologists retrospectively. The results revealed 28(14%) of the patients had normal study and 172 (86%) had abnormal study(diagram 1) and basing on the imaging findings, the pathology in the abnormal studies were classified as the following (diagram 2) : the appendicitis has the highest number 60 (35%) {figure 1}, ureteric stones 30(17%){figure 2}, the inflammatory bowel disease(IBD) 26(15%){figure 3}, gynecological causes 24 (14%){figure 4}, the epiploica appendagitis 13(7.5%), right colonic tumor12(7%){figure 5}, right sided diverticulitis 5(3%) {figure 6}and 2 (1.2%)of the patients were diagnosed with Meckel's diverticulitis. The diagnosis which was suspected by MDCT was proved by either, surgical intervention, another procedures or conservative follow up.

Discussion

Right iliac fossa is a common presentation encountered in the emergency department. Our study revealed the appendicitis is the commonest pathology 60 out of 200 patients (30%). Many studies were reviewed, and all of them revealed the appendicular pathology is the commonest right iliac fossa disease. For example, "role of computed tomography in diagnosis of appendicitis and its complications" Naglaa H Shebrya et al. (4), "Towards an evidence-based management of right iliac fossa pain in the over 50-year-old patient" Gammeri1E at al. (5), revealing 73% and 27% of their sample, respectively. And this adds on to our study result.

We highlighted in our study the role of multidetector CT, though it is not considered the first line of the imaging modalities in the emergency department. Its strength has been manifested in the atypical cases where the clinical data and ultrasound findings are not conclusive. For example, the sensitivity up to 97% for acute appendicitis (6) and up to 99% for acute colonic diverticulitis (7). The differential diagnosis of right iliac fossa pathology is broad, including gastrointestinal, genitourinary, and gynecological causes, in-spite of that, the CT findings combined with clinical settings can reach the diagnosis in most of the cases. The CT is a valuable modality for assessment of the appendicular pathology such as acutely inflamed appendix, appendicular abscess, mass, and perforation. When the appendix is normal the mimickers must be evaluated like the inflammatory bowel disease (Crohn, ulcerative colitis), and the CT has the capability to reach the diagnosis and more importantly evaluate the associated complications as abscess formation, collections, fistulas, and obstruction. Another gastrointestinal causes such as acute diverticulitis, mesenteric adenitis, epiploic appendicitis and omental infraction, the CT helps in guiding the management plan either surgery or conservative. Regarding the colonic tumor the CT will provide information about the nature of the thickening, presence of obstruction and the stage of the tumor that gives a road map for optimum management of the patients, where the sensitivity of CT to detect the neoplasm is around 70% (8). The commonest urological cause is renal stones, which can be found anywhere in the urinary tract. The caliculi occurs in 5% of the population, with high recurrence rate in about 50% (9). The non -contrast CT has a sensitivity of 95-100% accuracy when compared with intravenous pyelogram (IVP) (10). The gynecological causes should be considered in every female comes with right ilia fossa pain for example, complicated ovarian cysts, ovarian torsion, ectopic pregnancy and tubo-ovarian abscesses (11), familiarity of CT findings have a significant role to eliminate further unnecessary imaging modalities and to choose the proper management. Through the CT is not considered the primary imaging modality in assessment the acute gynecological pathologies as ultrasound. (12)

Conclusion

The MDCT is a valuable non-invasive imaging tool, it is used increasingly as it shows prompt and accurate diagnosis in most of the right iliac fossa pathology. More importantly in reducing the number of negative surgical exploration.

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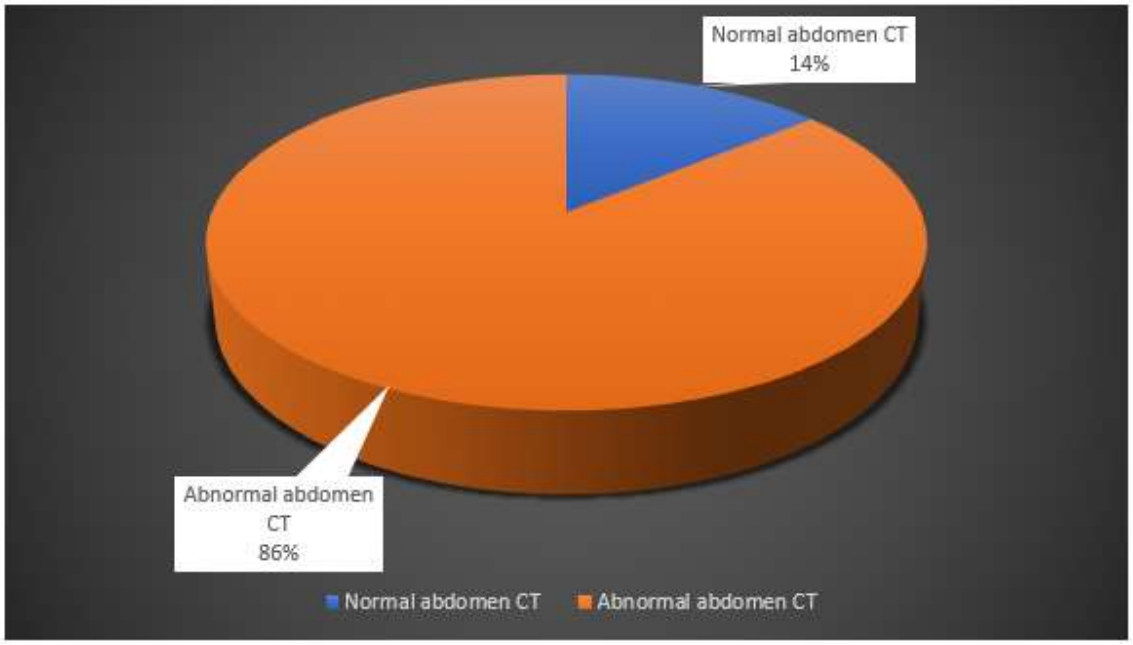

Diagram 1

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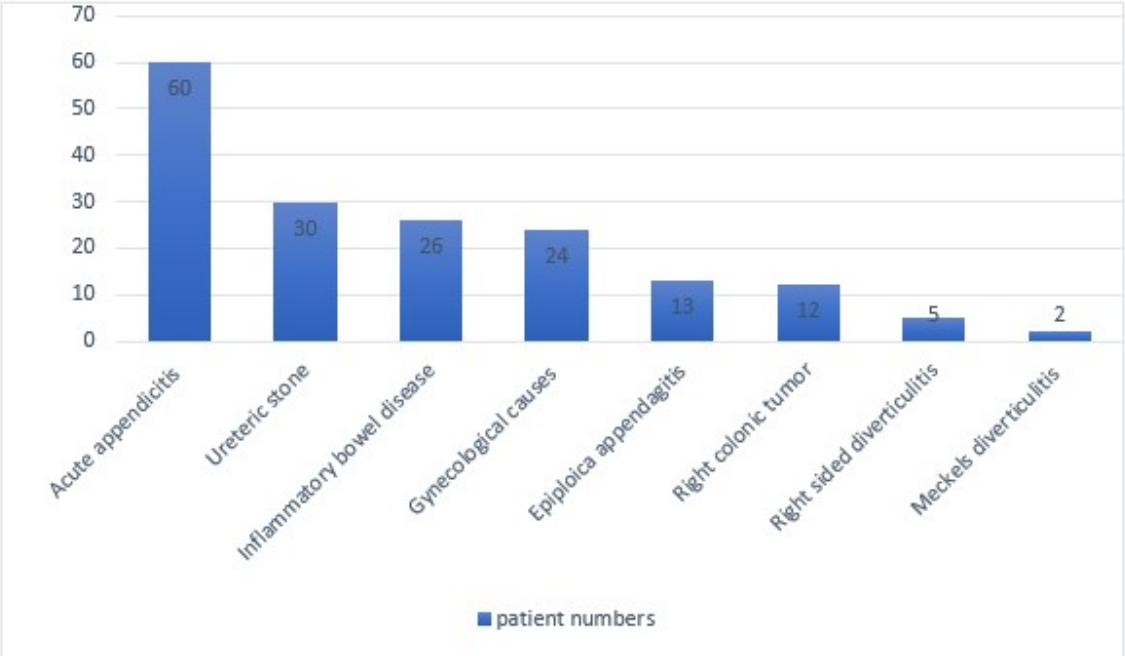

Diagram 2

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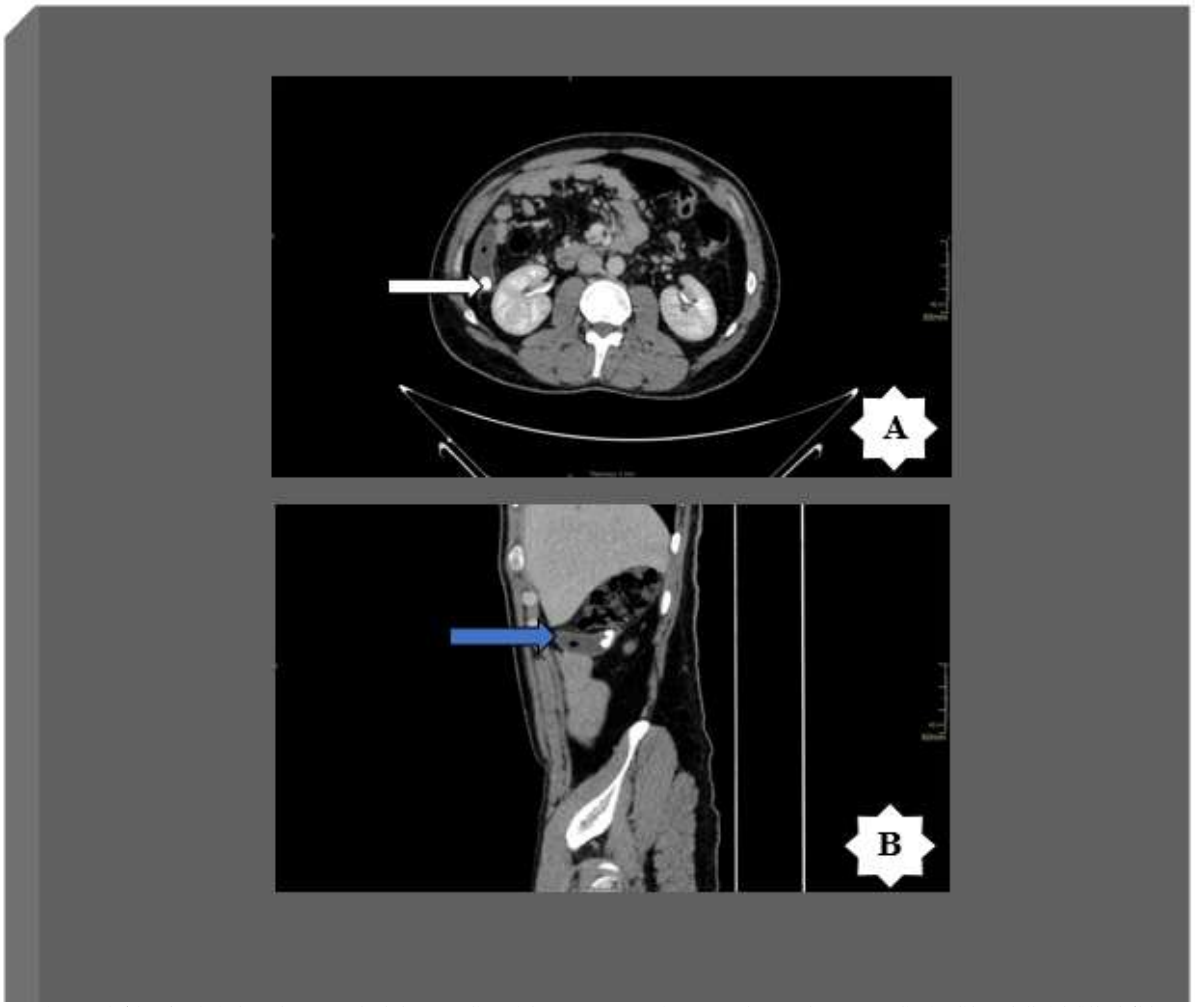

Figure 1 (A, B). Axial and coronal abdomen CT with IV contrast images shows the appendix is dilated fluid filled (blue arrow) with an appendicolith (whit arrow), feature of acute appendicitis.

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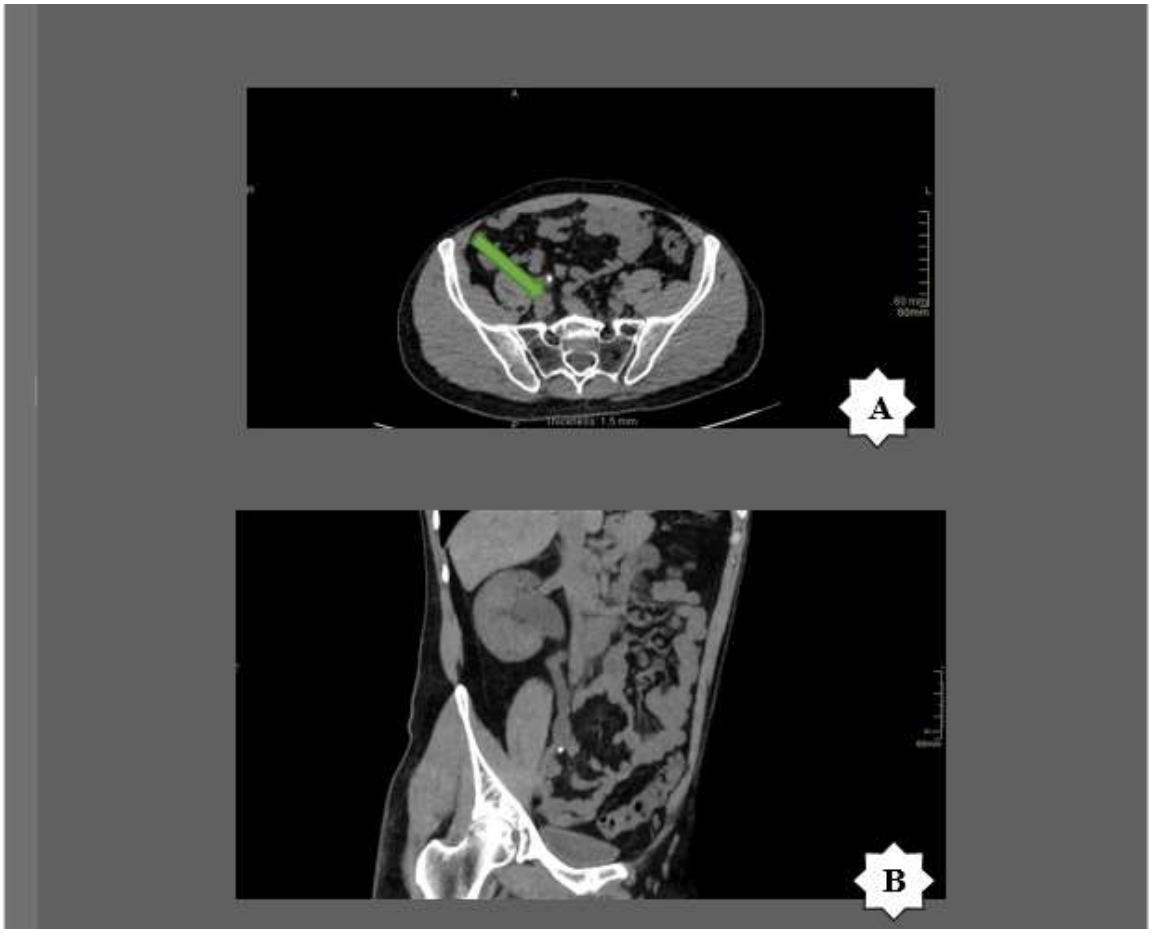

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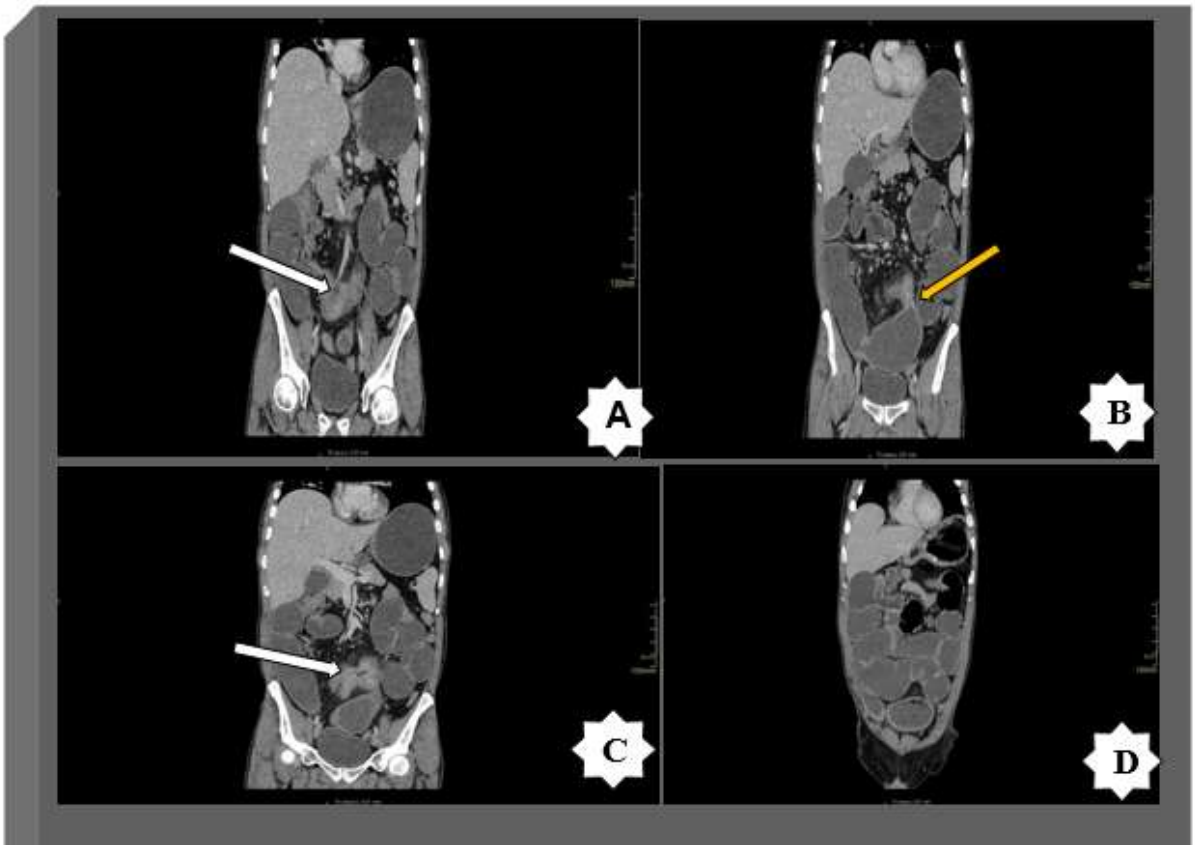

Figure 3 (A, B, C, D) abdomen CT with IV contrast coronal reformatted images shows circumferential wall thickening with mural hyperenhancement in the terminal and distal ileum (white arrow), with focal stricture ended this segment (yellow arrow) causing upstream small bowel dilation associated with inflammatory fat stranding. No abscess formation or fistula. Features are highly suggestive of active Crohn disease with small bowel obstruction.

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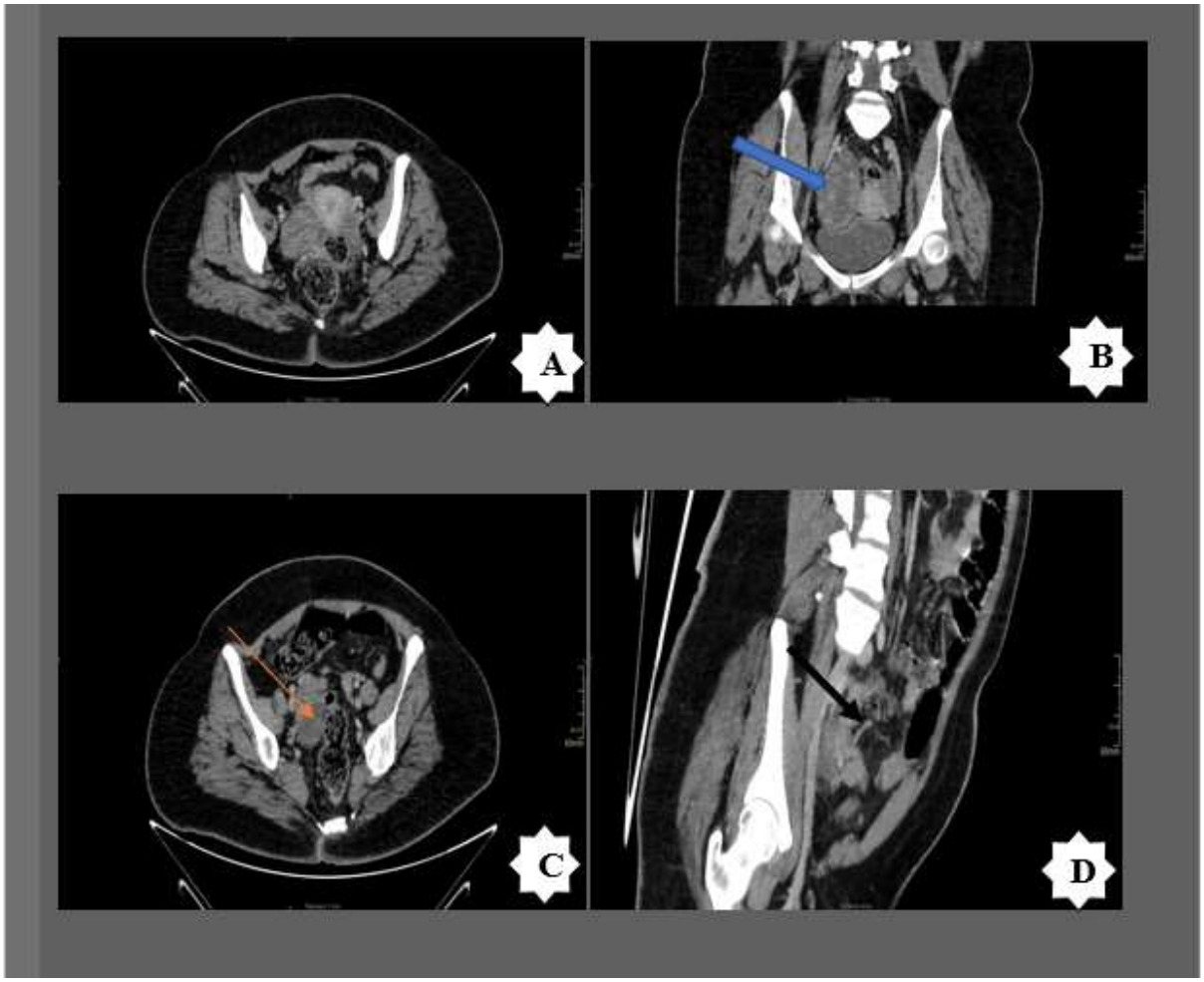

Figure 4 Abdomen and pelvic CT scan with IV contrast (A, B, C) axial and coronal reformatted images shows enlarged right ovary (blue arrow) with no central enhancement and cyst (orange arrow) seen in its lower pole (could represent the lead point) associated with fat stranding. Normal left ovary. (D) sagittal reformatted image reveals normal appendix (black arrow). Features of ovarian torsion.

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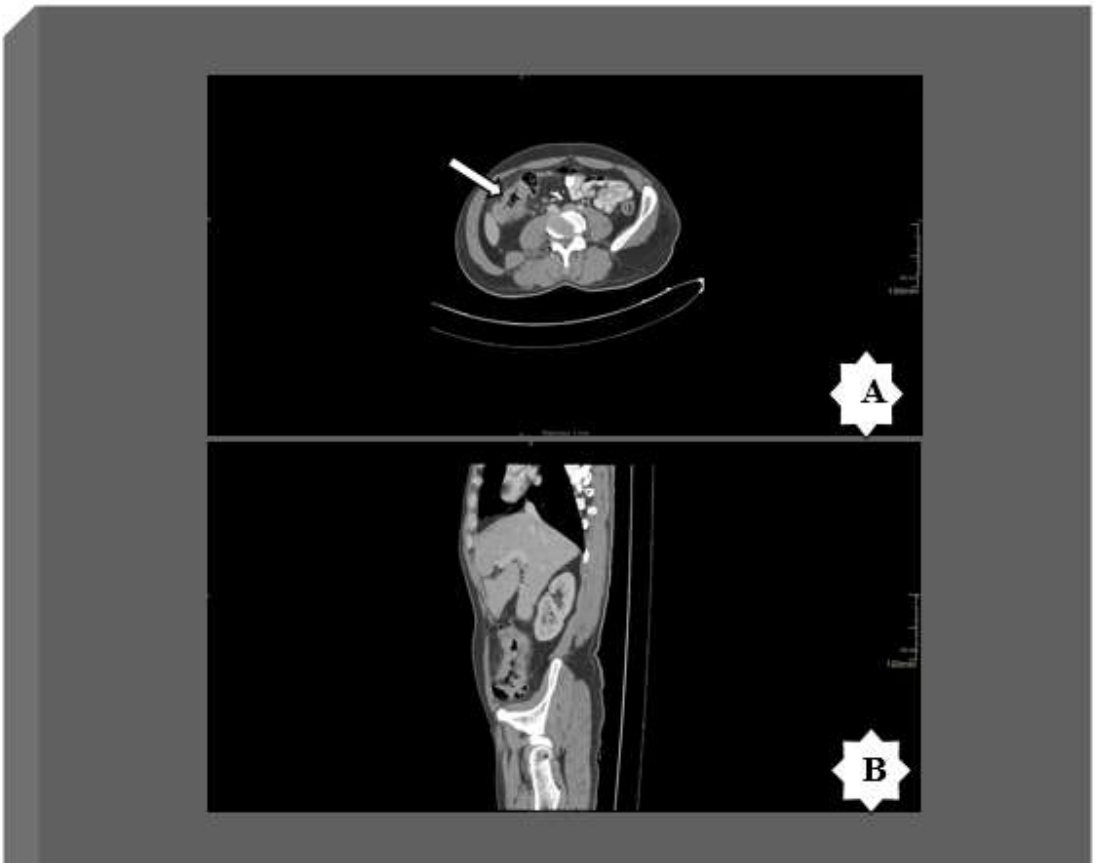

Figure 5 (A, B) abdomen CT with IV contrast axial and sagittal reformatted images shows a circumferential wall thickening in the ascending colon with adjacent lymph-node (whit arrow), the lack of fluid or pericolic inflammation favors colon cancer. adenocarcinoma was diagnosed by colonoscopy and biopsy.