Unexpected View in Plain Radiography of A Child with Abdominal Complains: A Case Report.

Abdominal Şikayetleri Olan Bir Çocukta Düz Radyografide Beklenmedik Görüntü: Bir Vaka Sunumu

Short Title: Erkek et al. Gastric wall thickening on plain radiography

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ABSTRACT

Objective: Plain radiography is a useful tool to distinguish many intraabdominal pathologies and rarely leads to a surprising diagnosis.

Clinical Presentation and Intervention: Here presented a 12 years old girl had abdominal complains, dull pain and tenderness with palpation in right upper quadrant, epigastrium and right flank. Plain radiography showed an opacification attached to gastric wall thickening. She was diagnosed as gastric ulcer, erosive gastropathy and duodenal ulcer with an endoscopic examination. Her NSAID medication was ceased, and she was commenced on proton pump inhibitor. Her symptoms, radiological and endoscopic findings abated after two months of treatment.

Conclusion: Gastric wall thickening seen on plain radiography as an opacified area is a rare evidence to peptic ulcer in children and may guide to choose endoscopy first instead of the other modalities giving radiation in further evaluation.

ÖZ

Objektif: Düz radyografi birçok intraabdominal patolojiyi ayırt etmek için yararlı bir araçtır ve nadiren şaşırtıcı bir tanıya götürür.

Klinik Sunum Ve Girişim: Burada sunulan 12 yaşındaki kız çocuğun abdominal rahatsızlığı, sağ üst kadrın, epigastrium ve sağ böğürde künt bir ağrısı ve palpasyonla hassasiyeti vardı. Düz radyografi gastrik duvar kalınlaşmasına bağlı bir opaklaşmayı gösterdi. Endoskopik inceleme ile gastrik ülser, eroziv gastropati ve duodenal ülser tanısı konuldu. NSAID ilacı kesildi ve proton pompa inhibitörü başlandı. İki aylık tedavinin sonunda semptomları, radyolojik ve endoskopik bulguları geriledi.

Sonuç: Opasifiye bir alan olarak düz radyografide görülen mide duvarı kalınlaşması, çocuklarda peptik ülser için nadir bir kanıttır ve ileri değerlendirmede radyasyon veren diğer modaliteler yerine, önce endoskopiye seçmeye kılavuzluk edebilir.

INTRODUCTION

Radiological imaging within a variety of modalities is extremely valuable as a diagnostic tool in pediatrics. In children with abdominal complaints plain abdominal radiographies allow initial assessment of a group of medical or surgical condition and disease. Plain abdominal radiographies can provide information on structures according to changes in soft tissue, air and bony densities. It's reported that plain radiographies for children presenting with abdominal complaints showed remarkable radiographic abnormalities in almost 17% of them. Findings might suggest for the presence of foreign body ingestion, pyloric stenosis, intussusception, ileus, obstruction, necrotising enterocolitis, gastroenteritis, pathologic calcification, and masses etc. They can be used to make definitive diagnosis or be a distinguishing tool to guide further investigations (1,2,3,4).

CASE AND QUESTION

A 12 years old girl presented with a history of nausea, vomiting, abdominal discomfort and pain for four days. Pain was of acute onset, located in the right upper quadrant and radiated to back side of the patient. There was no relevance with meal. She did not point out any blood or bile in vomit. She also stated that she had seasonal mild dyspeptic complaints for one year but without any medical evaluation. She has taken non-steroidal anti-inflammatory drugs (NSAID) by orally 1-4 tablets per day for four days. In her medical history it was revealed that she has had asthma and has been on prophylactic inhaled budesonide for two years, and she was heterozygous for familial mediterranean fever. She was living with her recently divorced single mother. Her mother had dyspeptic complaints with no definitive diagnosis and did not receive any treatment. On physical examination she was well and cooperative. Her body temperature was 36.2° C, HR 84/min, RR 18/min, ABP 123/ 74 mmHg, SPO2 99%. She has a soft abdomen but a dull pain and tenderness in right upper quadrant, epigastrium and right flank on palpation. Her complete blood count, electrolytes, blood biochemistry for liver enzymes and renal function tests, pancreatic amylase, lipase, urine analyses for microscopy and crystaluria, urine culture were not significant. Due to rule out of renal or biliary pathologies such as calculi, plain radiography was performed and consulted by radiology department. (Figure 1).

What are the radiological findings and what is the likely diagnosis?

DISCUSSION AND CASE PROGRESS:

Plain radiography of the patient showed an irregularly circular opacified area in left upper quadrant. There are wide variety of calcifications seen on plain abdominal radiography those can be categorized by location such as calculi of urinary tract, calcifications of digestive tract, liver and gall bladder, peritoneal and surrenal region calcifications, phleboliths, appendicoliths, vascular calcifications etc. (5,6). Radiology department stated that there was an opaque area attached to gastric wall thickening and no other abnormalities in plain radiography of the patient.

Gastric wall internal surface consist of two mucosal pattern; area gastricae and gastric ruggae. Gastric ruggae are macromucosal folds of mucosa and submucosa that tend to paralel to long axis of stomach that normally about 3-5 mm thick on CT imaging and barium studies.

Presence of abnormalities such as thicker and nodular rugal folds, reflected as gastric wall thickening, may be signified additional pathological process (7,8). In differential diagnosis of gastric wall thickening, there are various causes such as malignancies, infections, chronic inflammation, corrosive ingestion, radiotherapy, eosinophilic gastroenteritis, amyloidosis and rarely H. pylori gastritis (9,10) There reported several adult patients, but no child, whose plain

radiographs showed spheric, solitary or punctate calcifications in left upper quadrant with gastric wall thickening diagnosed as gastrointestinal stromal tumor (11).

It's reasonable to advise that preferred imaging modality to depict the etiology of gastric wall thickening should be computerized tomography (CT) or upper gastrointestinal double contrast imaging (9,10). However, our patient had a pain located in the right upper quadrant and radiating to her back side. To rule out other abdominal pathologies with similar symptoms such as renal calculi, cholelithiasis, mass or mesenteric lymphadenitis, an abdominal ultrasonography (US) was preferred in our patient and revealed no significant findings. Before ordering another imaging modality she was consulted with pediatric gastroenterology and then endoscopic examination demonstrated multiple lesions compatible with duodenal mucosal ulcer and hemorrhagic erosive gastritis and ulcer (**Figure 2**). Gastric and duodenal biopsies were taken and demonstrated mild grade duodenitis, erosive gastritis with negative *H. Pylori* result, and no atrophy or atypical figure. It's reported in literature that exaggerated gastric folds appearance might be related to an underlying mucosal inflammation with excessive production of acid, mucus and exudate (7,12).

Gastritis, gastric and duodenal ulcers occur infrequently in the pediatric population. Children present with a dull pain of hunger in epigastrium described as a gnawing or burning sensation, abdominal discomfort, fullness, nausea, vomiting, bloating. When aggressive factors overwhelm the natural mucosal protective barriers, gastritis and ulcers appear. Besides having intermittent dyspeptic complaints, the patient also had a recent history of NSAID and inhaled budesonide use, and possible separation anxiety of our patient might also have been related to her gastric pathologies (13,14). Consequently it can be said that factors mentioned above have detrimental effects those resulting in inflammation and gastric epithelial and fibromuscular hyperplasia, vascular ectasia and edema, which may explain the reflection of opaque area attached to gastric wall thickening on plain radiography (7).

We preferred plain radiography first to eliminate opaque and semiopaque gallstones and urinary stones. Other imaging modalities such as US or CT can visualize the location, origin and structure of the abdominal pathology. US was preferred because of cost effectivity and to avoid side effects of radiation (15).

As a good negative finding we could not figure out gastric wall on ultrasonography and also could eliminate cholelithiasis, nephrolithiasis and intraabdominal mass with calcification as differentials (16). It was reasonable to give priority for endoscopic examination of our patient because her complaints pointed at gastric discomfort and also because endoscopy with biopsy is the gold standard to diagnose gastric mucosal pathologies if it is available (14,17).

She was advised to discontinue NSAID, prescribed proton pump inhibitor and follow-up examination was arranged (13,14,17). Her re-evaluation after two months of treatment revealed improvement in her complaints and her radiological and endoscopic findings as shown in literature (18).

CONCLUSION

Gastric wall thickening as an opaque area seen on plain radiography is an exceptional visual evidence in children and may be considered performing endoscopy first instead of the other modalities with radiation. To our knowledge, there have been no reports to explain such a radiological finding associated with a bundle of abdominal complaints and peptic disease in children. We also want to emphasize that when exploring varying causes of abdominal complaints in a child, what the patient's history and physical examination are indicating, and what the benefit and harm of the preferred imaging modality are, should be considered.

4.1 SIGNIFICANCE OF THE STUDY

To our knowledge, there have been no reports of such a finding in pediatric patient, gastric wall thickening as an opacified area related with gastric ulcer seen on plain radiography. This

is an exceptional visual evidence and may lead on endoscopy first instead of the other techniques with radiation.

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Figure 1. Abdominal plain radiography of the patient shows an opaque area attached to gastric wall thickening

Figure 2. Endoscopic findings of the patient **A)** An erosive gastropathy area on fundus **B)** An 0.5 cm in diameter acute ulcer area on bulbous wall