ACİL SERVİSTE ABDOMİNAL GÖRÜNTÜLEME

Uz. Dr. Gülşah ÇIKRIKÇI IŞIK
MARDİN- Mart 2017

KAYNAKLAR

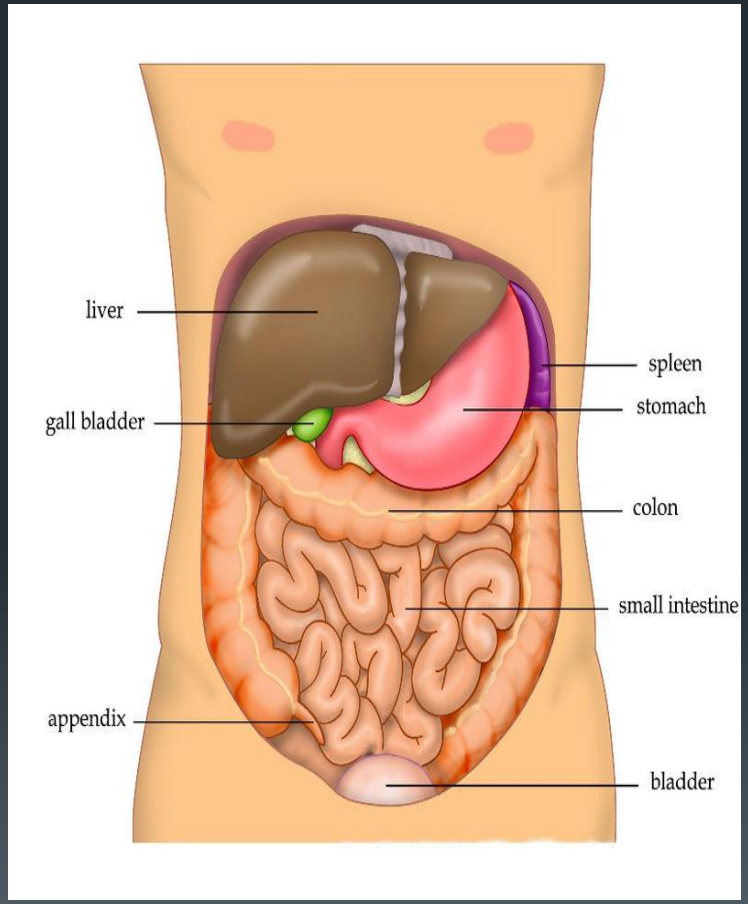
- Diagnostic imaging for the emergency physician, Joshua S. Broder MD
- Abdominal ağrı: USG mi? BT mi? MRI mı? Dr. Müge GÜLEN
- Akut karında görüntüleme yöntemleri Dr. Arif Karagöz

Sunum Planı

- Abdomen neresidir?
- Non-travmatik abdominal durumlarda görüntüleme
  - Direkt grafiler
  - Bilgisayarlı tomografi
  - Ultrasonografi
  - Manyetik rezonans görüntüleme
- Travmada abdominal görüntüleme
- Özet
- Kaynaklar

Abdomen

- Abdomen torasik diyafram ve pelvik girim arasında kalan alandır.
- Pelvik girim lumbosakral eklemden simfizis pubise uzanan hayali çizgi olarak kabul edilir.



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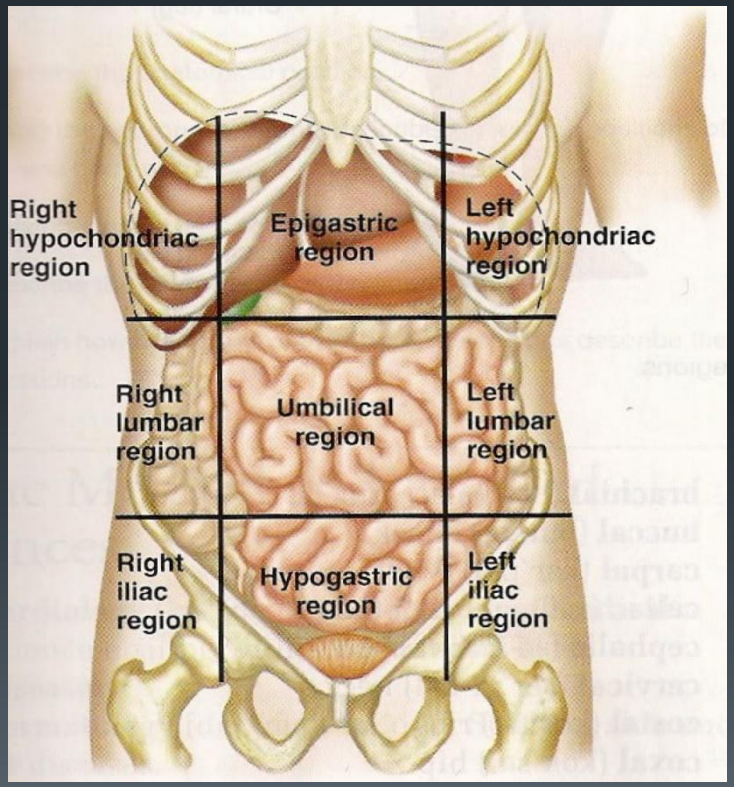
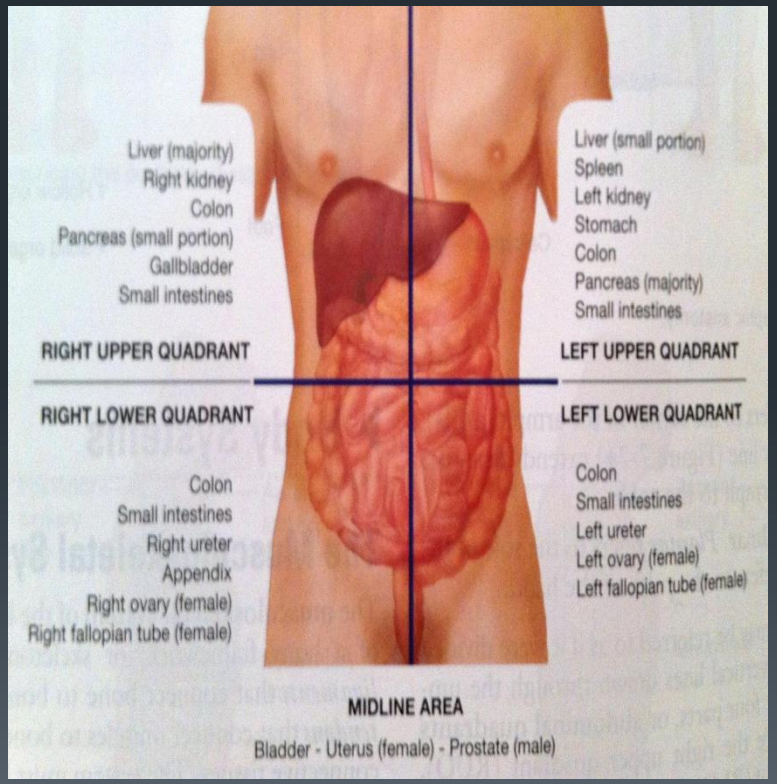
Abdomen





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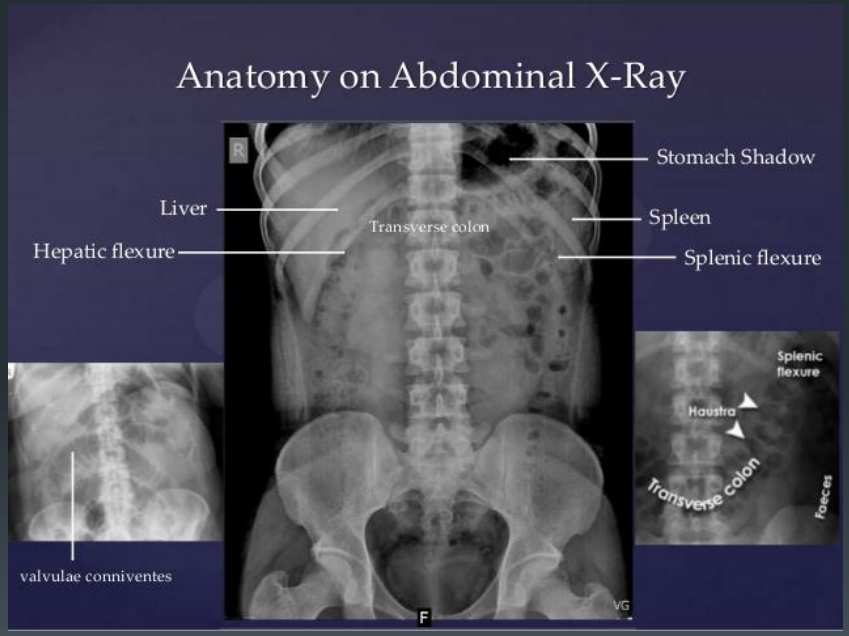
Non-travmatik abdominal durumlarda görüntüleme

- Acil servis başvurularının %8'ini kusma, karın ağrısı gibi abdominal patolojileri işaret eden şikayetler oluşturmaktadır.
- En sık kullanılan görüntüleme yöntemleri
  - Direkt grafiler
  - Ultrasonografi
  - Bilgisayarlı tomografi
    - MRI
    - Nükleer sintigrafi
    - Abdominal anjiografi

Direkt grafiler

- Avantajları
  - Radyasyon oranı çok düşüktür
  - Ulaşılabilmesi kolaydır
- Dezavantajları
  - Çoğu zaman tanı ve tedavi modalitesinin belirlenmesinde yetersizdir.



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Direkt grafiler- AYAKTA DBG

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Direkt grafiler

YATARAK DBG

LATERAL DEKUBİT G

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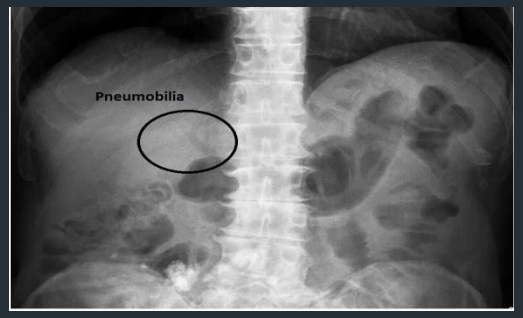
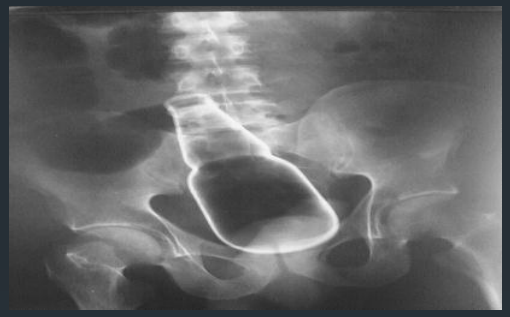
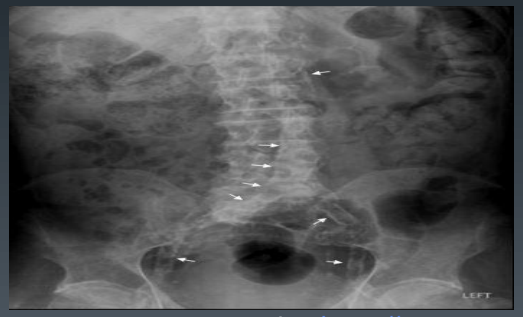
Direkt grafiler







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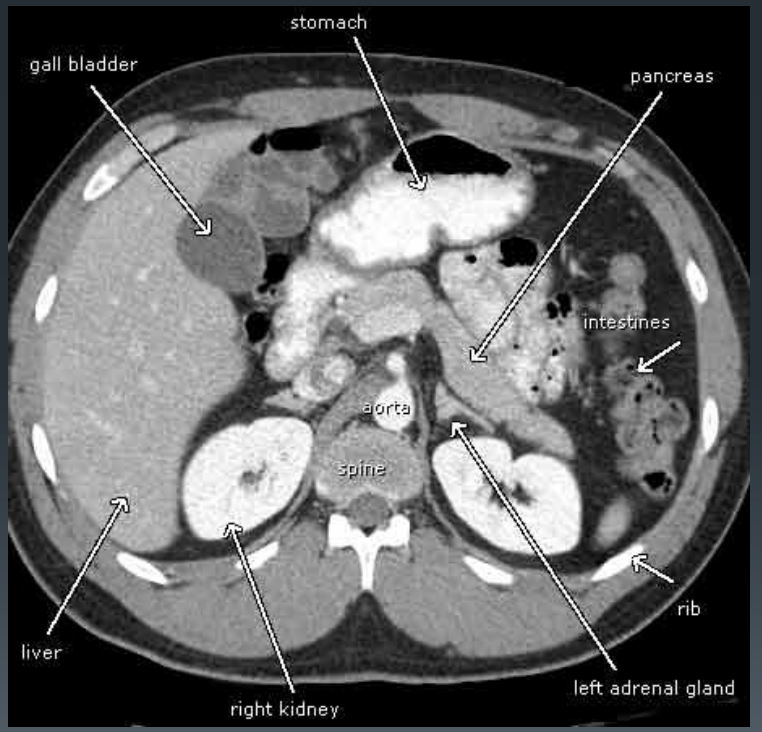
5. https://www.google.com.tr/imgres?imgurl=https%3A%2F%2Fimages.radiopaedia.org
6. https://www.google.com.tr/imgres?imgurl=http%3A%2F%2Fwww.nle.nottingham.ac.uk

Bilgisayarlı tomografi

- Avantajları
  - Sonuçlar uygulayıcıdan bağımsızdır.
  - Retroperitonu daha iyi gösterir
  - Farklı planlarda görüntü sunar.
- Dezavantajları
  - Radyasyon içerir.
  - Kontrast maddeye bağlı komplikasyonlar gelişebilir.



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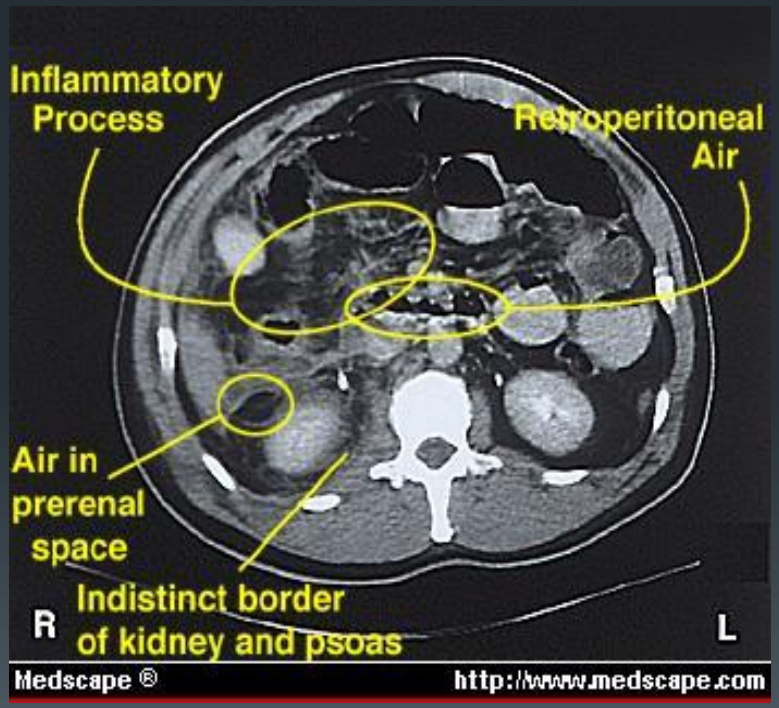
Bilgisayarlı tomografi

- IV kontrast madde
  - Periferik damardan verilir ve vaskuler yapıları görünür kılar.
  - Kanın fazla gittiği organlar (böbrek gibi) daha fazla kontrast tutar.
  - Enfeksiyon durumunda da kanlanma artacağından kontrast tutulumu artar.
  - Kontrastlı BT ile damarlarda ki darlık ve end organlardaki dolum defektleri tespit edilebilir.
  - Ekstravaze olması durumunda aktif kanamayı da gösterir.



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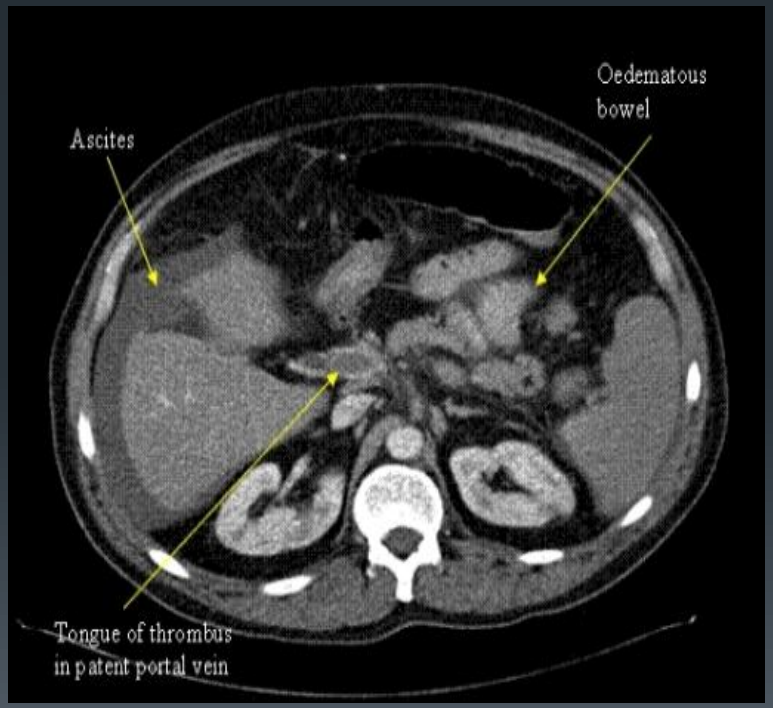
Bilgisayarlı tomografi

- IV kontrast madde
  - İlaç verildikten 20-25 sn sonra çekime başlanır. (arteriyel faz)
  - Mesenter iskemi gibi durumlarda portal sistemide görüntülemek amaçlı 60-90.snde de çekim yapılmalıdır (geç faz)
  - Kontrast böbrekler yoluyla atıldığından geç fazdaki çekimler üriner sistemide görünür kılar.



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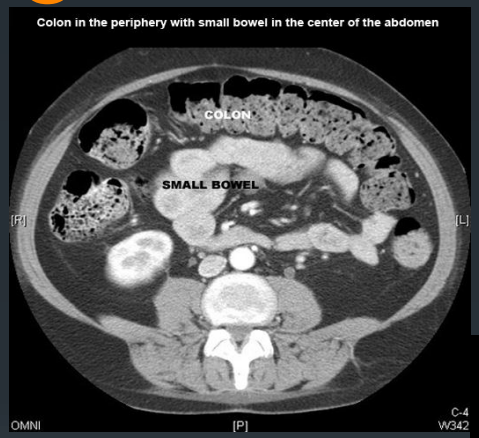
Bilgisayarlı tomografi

- ENTERAL kontrast madde
  - Oral veya rektal
  - Barsakları doldurarak görünür kılar ve böylece **obstruksiyonun** seviyesini gösterebilir.
  - Kontrast barsak lumeni dışına çıkarsa intestinal **perforasyonu** göstermiş olur.
  - Polip gibi kitle lezyonlarını dolum defekti şeklinde gösterebilir.
  - Rektal kontrast perirektal ve sigmoid abseler yada perforasyonlarda, kontrast bölgeye daha hızlı ulaşacağından tercih edilir.



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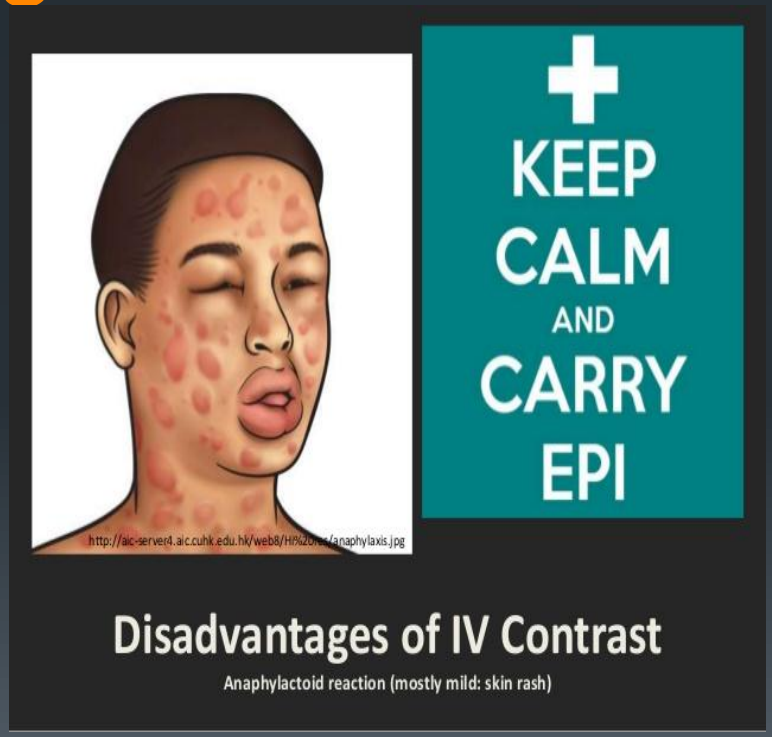
https://encrypted-tbn1.gstatic.com/images

Bilgisayarlı tomografi

- ***Kontrast alerjisi***
- Sıklık
  - Ürtiker kaşıntı gibi hafif reaksiyonlar %3-15 sıklıkta görünür
  - Hipotansiyon, respiratuar distress gibi daha ciddi reaksiyonlar %0.04-0.004 sıklıkla olur.
  - Ölüm ise 1/170.000 olara bildirilmiştir.
- Risk ; allerjik bünyesi olanlarda ve astım hastalarında daha yüksek
- Tedavi; allerjenden uzaklaştırma ve rutin anafilaksi tedavisi



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Bilgisayarlı tomografi

- ***Kontrast nefropatisi***
- Kontrast alımından sonraki 48 saatte basal kreatininde %25 veya 0,5 mg/dl artma
- Riskler; azalmış kreatinin klirensi, DM, HT, KY, ileri yaş
- Önlemek için;
  - 100 ml/sa normal salin çekim öncesi 6-12 sa, sonrası 4-12 sa
  - Bikarbonat, NAC
- Diyaliz hastalarında?

Iran J Radiol. 2016 Jan 9;13(2):e33222. eCollection 2016.

Diagnostic Performance on Low Dose Computed Tomography For Acute Appendicitis Among Attending and Resident Radiologists.

Chang CC1, Wong YC1, Wu CH1, Chen HW1, Wang LJ1, Lee YH1, Wu PW1, Irama W1, Chen WY1, Chang CJ2.

Abstract

BACKGROUND:

Low-dose computed tomography (LDCT) techniques can reduce exposure to radiation. Several previous studies have shown that radiation dose reduction in LDCT does not decrease the diagnostic performance for appendicitis among attending radiologists. But, the LDCT diagnostic performance for acute appendicitis in radiology residents with variable training levels has not been well discussed.

OBJECTIVES:

To compare inter-observer and intra-observer differences of diagnostic performance on non-enhanced LDCT (NE-LDCT) and contrast-enhanced standard dose CT (CE-SDCT) for acute appendicitis among attending and resident radiologists.

PATIENTS AND METHODS:

This retrospective study included 101 patients with suspected acute appendicitis who underwent NE-LDCT and CE-SDCT. The CT examinations were interpreted and recorded on a five-point scale independently by three attending radiologists and three residents with 4, 1 and 1 years of training. Diagnostic performance for acute appendicitis of all readers on both examinations was represented by area under receiver operating characteristic (ROC) curves. Inter-observer and intra-observer AUC values were compared using Jackknife FROC software on both modalities. The diagnostic accuracy of each reader on NE-LDCT was compared with body mass index (BMI) subgroups and noise using independent T test.

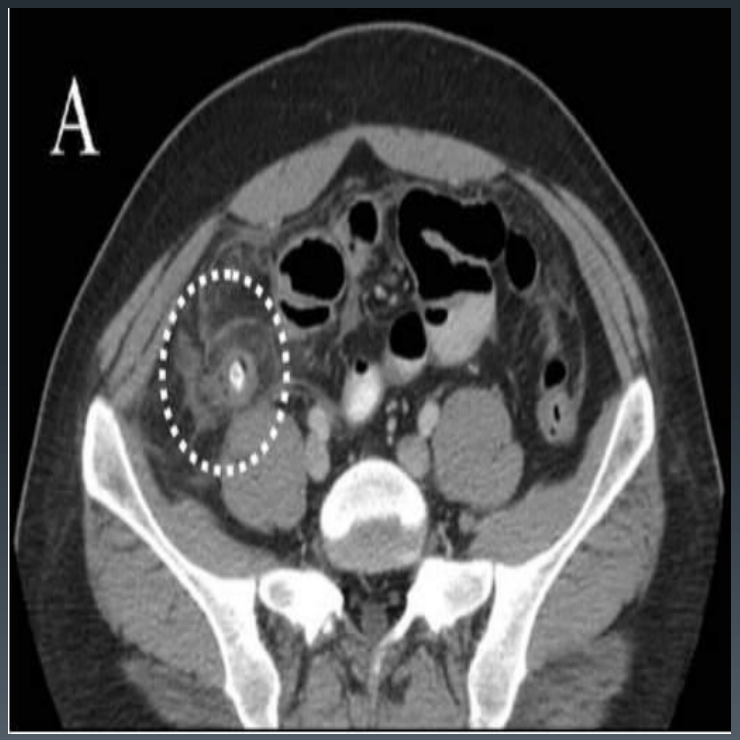
RESULTS:

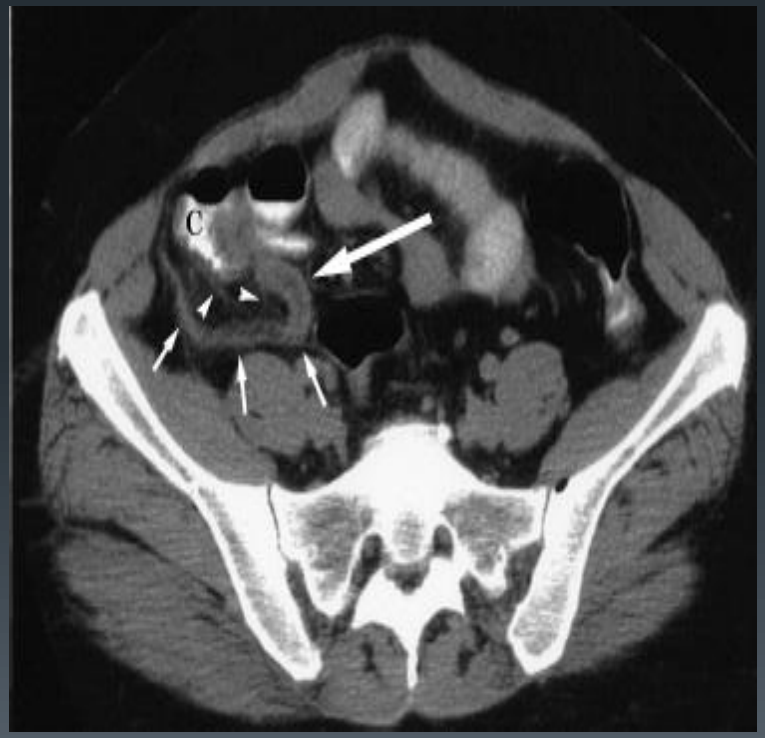
Diagnostic performances for acute appendicitis were not statistically different for attending radiologists at both examinations. Better performance was noted on the CE-SDCT with a borderline significant difference (P = 0.05) for senior radiology resident. No statistical difference of AUC values was observed between attending radiologists and fourth year resident on both examinations. Statistically significant differences of AUC values were observed between attending radiologists and first year residents (P = 0.001 ~ 0.018) on NE-LDCT. Diagnostic accuracies of acute appendicitis on NE-LDCT for each reader were not significantly related to BMI or noise.

CONCLUSION:

Attending radiologists could diagnose acute appendicitis accurately on NE-LDCT. Performance of senior residents on NE-LDCT is better than junior residents and comparable to attending radiologists.

Apandisit





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2. https://www.google.com.tr/imgres?imgurl=http%3A%2F%2Fwww.lumen.luc.edu%2Flumen

Ultrasonografi

- Avantajları
  - Ucuz, kolay ulaşılır, radyasyon içermez, tekrarlanabilir
- Dezavantajları
  - Uygulayıcı bağımlı
  - Retroperitonu göstermede yetersiz
  - Abdominal gaz, obezite gibi durumlar görüntülemeyi etkiler
- Doppler USG

- Kullanım alanları
  - Solid organ yaralanmaları
  - Safra kesesi ve safra yolları patolojileri
  - Hidronefroz, böbrek taşları
  - Kadınlarda pelvik patolojiler
  - Asit
  - Testis torsiyonu, epididimit
  - Abdominal anevrizmanın yatak başı değerlendirilmesi

J Ayub Med Coll Abbottabad. 2014 Jan-Mar;26(1):12-7.

Diagnostic accuracy of ultrasonography in acute appendicitis.

Hussain S, Rahman A, Abbasi T, Aziz T.

Abstract

BACKGROUND:

The diagnosis of acute appendicitis is mainly clinical and to augment the clinical diagnosis ultrasonography and Computerized Tomographic Scan of the abdomen are also being used to help in diagnosis of the disease; which all carry some inherent limitations. This study was done to establish diagnostic accuracy of Ultrasonography (USG) in acute appendicitis taking histopathology of removed appendix as the gold standard.

METHODS:

This cross-sectional validation study was conducted in Radiology Department, Military Hospital and Combined Military Hospital Rawalpindi from July 2007 to January 2008. Sixty cases of clinically suspected acute appendicitis were selected on non-probability convenience sampling technique. All of them underwent ultrasound evaluation. Diagnostic accuracy of USG was calculated keeping histopathology of the removed appendix as gold standard whenever appendectomy was carried out.

RESULTS:

Out of 60 patients whose USG of right lower quadrant was performed, 30 patients were correctly diagnosed as having acute appendicitis on USG out of 34 finally diagnosed cases based on histopathology. Similarly we picked 12 normal appendices out of 26 non-appendicitis patients. This showed that US scan **has sensitivity of 88%, specificity of 92%,** positive predictive value of 94%, negative predictive value of 86%, and overall accuracy of 90%. The most accurate appendiceal finding for appendicitis was a diameter of 7 mm or larger followed by non-compressibility of inflamed appendix.

CONCLUSION:

Ultrasonography has high accuracy in diagnosing acute appendicitis and reduces negative appendectomies. Greater than 6-mm diameter of the appendix under compression is the most accurate USG finding with high positive predictive value for the diagnosis of acute appendicitis.

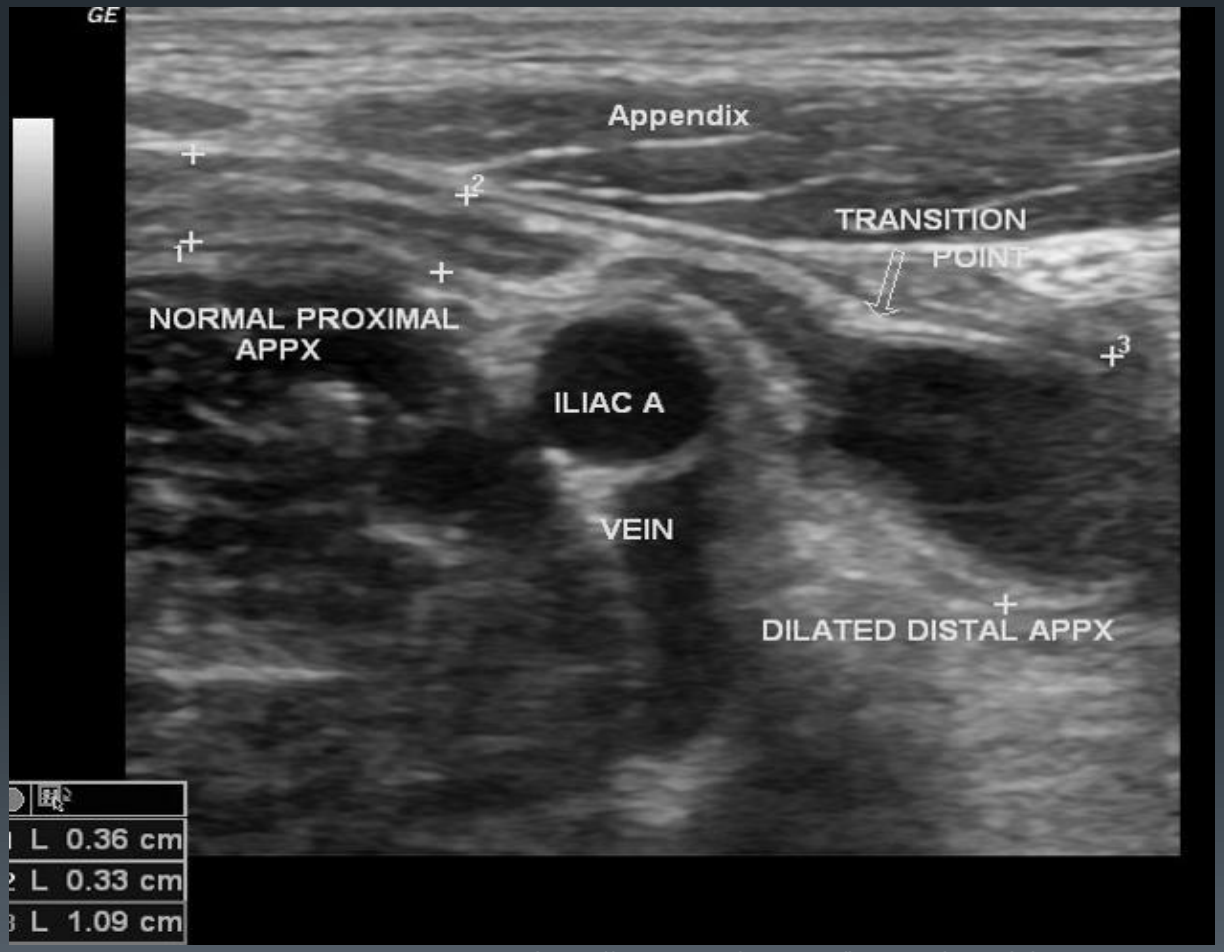
Indian J Surg. 2015 Dec;77(Suppl 2):221-6. doi: 10.1007/s12262-012-0772-5. Epub 2012 Dec 9.

On the Role of Ultrasonography and CT Scan in the Diagnosis of Acute Appendicitis.

Debnath J1, Kumar R2, Mathur A3, Sharma P4, Kumar N5, Shridhar N6, Shukla A7, Khanna SP5.

Abstract

The purposes of this study were to revisit the utility of ultrasonography (USG) as a primary imaging modality in acute appendicitis (AA) and to establish the role of CT scan as a second-line/problem-solving modality. All cases of suspected AA were referred for urgent USG. USG was done with standard protocol for appendicitis. Limited computed tomographic (CT) scan [NCCT ± CECT (IV contrast only)] was done for the lower abdomen and pelvis where sonographic findings were equivocal. One hundred and twenty-one patients were referred for USG for suspected appendicitis. Eight-four patients underwent surgery for AA based on clinical as well as imaging findings, of whom 76 had appendicitis confirmed at histopathology. Three patients were misdiagnosed (3.6 %) on USG as appendicitis. Of 76 patients of appendicitis confirmed histopathologically, 63 (82.8 %) had features of appendicitis on USG and did not require any additional imaging modality. Of 121 patients, 12 (10 %) needed CT scan because of atypical features on USG. Of these 12 patients, seven had retrocecal appendicitis, and three high-up paracolic appendicitis. USG alone had sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy of 81, 88, 92.6, 71.6, and 83 %, respectively. When combined with CT scan in select cases, the sensitivity, specificity, PPV, NPV, and accuracy of combined USG + CT scan were 96 % (P = 0.0014), 89 %, 93 %, 93.5 % (P = 0.0001), and 93 % (P = 0.0484), respectively. Twenty-eight (23 %) patients were given alternative diagnosis on USG. Dedicated appendiceal USG should be used as a primary imaging modality in diagnosing or excluding AA. Appendiceal CT can serve as a problem-solving modality.



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MRI

- Avantajları
  - Yumuşak doku kontrast rezolüsyonu yüksek
  - Radyasyon içermez
- Dezavantajları
  - Pahalı
  - Uzun sürer
  - Ulaşılabilirliği sınırlı
  - Kontraendikasyonlar (pace, saçma çekirdeği)
  - Klastrofobi
- Acilde kullanımı gebe karın ağrılarıyla sınırlı!

Abdom Radiol (NY). 2017 Feb 13. doi: 10.1007/s00261-017-1078-7. [Epub ahead of print]

Clinical use of MRI for the evaluation of acute appendicitis during pregnancy.

Patel D1, Fingard J2, Winters S2, Low G2.

Abstract

PURPOSE:

The purpose of this study was to determine the diagnostic accuracy of MRI for detecting acute appendicitis in pregnancy in a multi-institution study involving general body MR readers with no specific expertise in MR imaging of the pregnant patient.

METHODS:

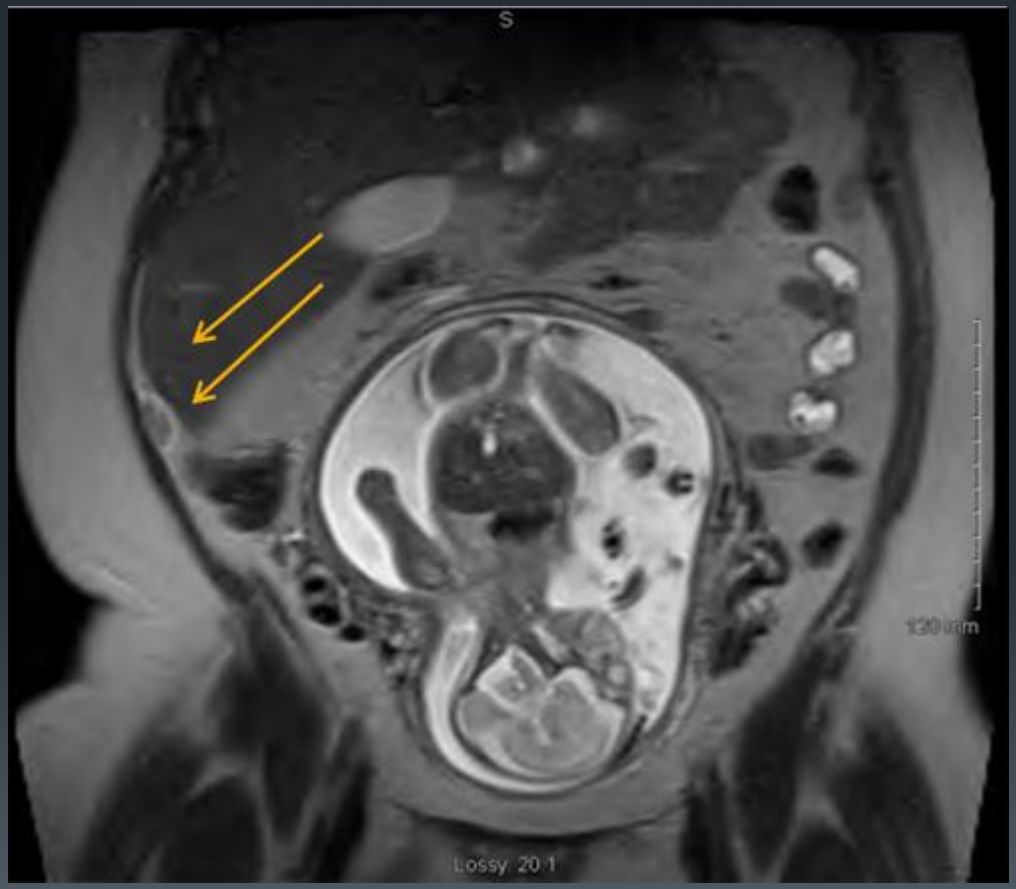
Retrospective review of MRI examinations on PACS in 42 pregnant patients was evaluated for acute right lower quadrant pain. Three fellowship-trained general body radiologists analyzed the MRI examinations in consensus and attempted to localize the appendix, assess for features of appendicitis, and exclude alternative etiologies for the right lower quadrant pain.

RESULTS:

Of the 42 MRI examinations, the readers noted 6 cases of acute appendicitis, 16 cases of a normal appendix, and 20 cases involving non-visualization of the appendix but where there were no secondary features of acute appendicitis. Based on the surgical data and clinical follow-up, there were 3 true-positive cases, 3 false-positive cases, 34 true-negative cases, and 2 false-negative cases of acute appendicitis on MRI. This yielded an accuracy of 88.1%, sensitivity of 60%, specificity of 91.9%, positive predictive value of 50%, and negative predictive value of 94.4% for the detection of acute appendicitis in the pregnant patient on MRI. Alternative etiologies for the right lower quadrant pain on MRI included torsion of an ovarian dermoid in 1 case and pyelonephritis in 1 case.

CONCLUSION:

MRI is an excellent modality for excluding acute appendicitis in pregnant patients presenting with right lower quadrant pain.



https://www.google.com.tr/imgres?imgurl=http%3A%2F%2Fwww.auntminnie.com

Travmada abdominal görüntüleme

- Unstabil hasta için; acil serviste görüntüleme için harcana süre minimum olmalı ki hayati operatif girişimler için zaman kaybı olmasın

- Stabil hasta için ise; gereksiz görüntülemeden kaçınalım ki hasta fazladan radyasyon almasın ve tedavi maliyeti de artmasın

Travmada direkt grafi

- Kullanımı oldukça sınırlı.
- İçi boş organ ve solid organ yaralanmalrını göstermede yetersiz.
- Ateşli silah yaralanmalarında fikir verici olabilir.

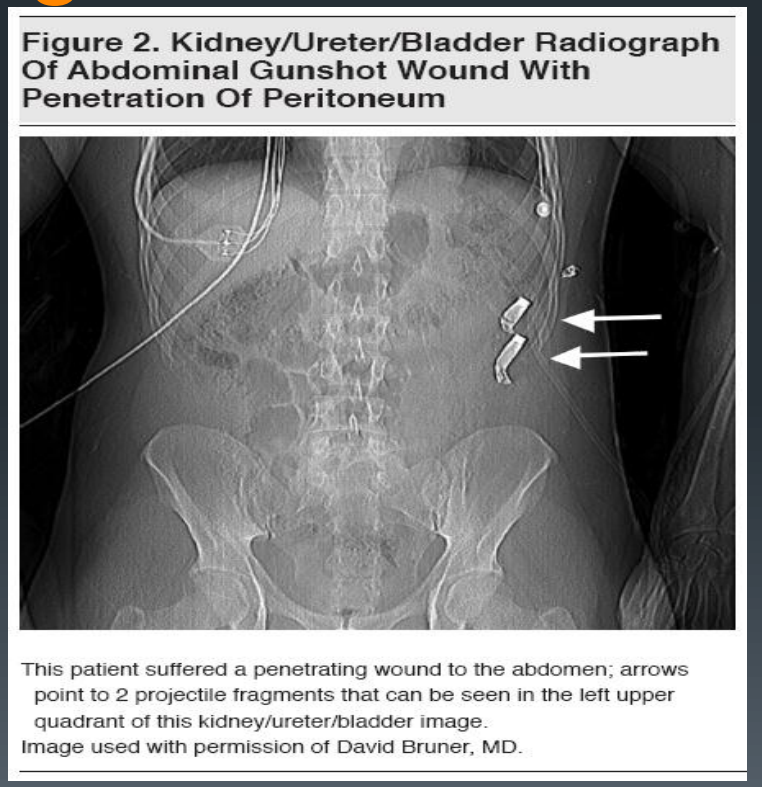


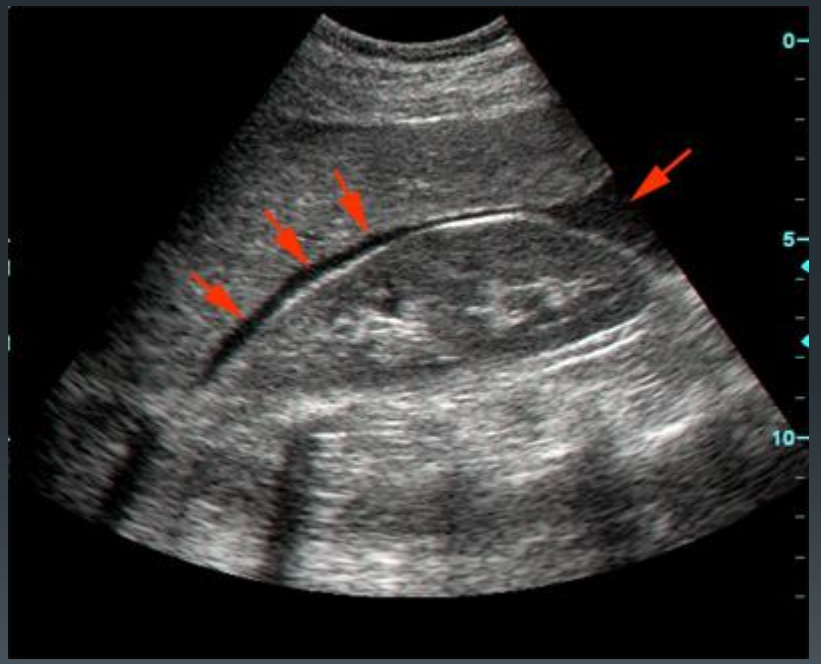
Figure 2. Kidney/Ureter/Bladder Radiograph Of Abdominal Gunshot Wound With Penetration Of Peritoneum

This patient suffered a penetrating wound to the abdomen; arrows point to 2 projectile fragments that can be seen in the left upper quadrant of this kidney/ureter/bladder image.
Image used with permission of David Bruner, MD.

https://www.google.com.tr/imgres?imgurl=http%3A%2F%2Fwww.ebmedicine.net%2Fmedia_library

Travmada USG

- **FAST**: focused abdominal sonography for trauma
  - Sağ üst kadran (morrison poşu, hepatorenal alan)
  - Sol üst kadran (splenorenal alan)
  - Suprapubik alan (pelvis)
  - Perikardium (çoğunlukla supksifoid yaklaşımla)



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Travmada USG

- 700 ml de Morrisonda görünür.
- Hasta trendelenburg pozisyonuna alınır veya ehil bir kişi tarafından yapılırsa 400 ml sıvıda görünür
- Sıvı miktarı 1 lt ise sensitivitesi %97 dir.

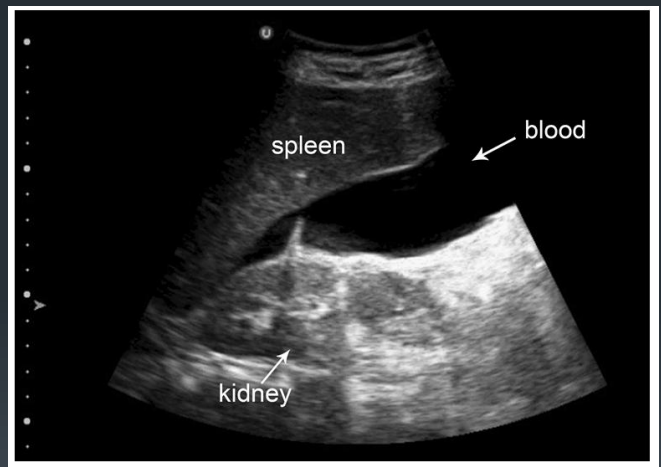

Figure 14

https://www.google.com.tr/url?sa=i&rct=j&q=&esrc=s&source=imgres&cd

Travmada USG

- Dezavantajları;
  - Kanamanın kaynağını herzaman gösteremez.
  - Retroperitonu ve barsak yaralanmalarını görüntülemede yetersizdir.

Travmada BT

- Hem künt hem penetran travmalarda en iyi görüntüleme yöntemi
- Sensitivitesi ve spesivitesi yüksek ve hızlı
- Diyafram yaralanmalarında sensitivitesi düşük.

http://img.medscapestatic.com/pi/meds/ckb/63/36363tn.jpg

Künt travmada kontrast endikasyonları

- Kontrastsız BT de: hava, solid organlar, serbest sıvı seçilebilir.
- KONTRAST:
  - Solid organ yaralanmasında, hasarlı kısım kontrast tutamaz böylece normal dokudan ayrımı kolaylaşır.
  - Aktif kanamayıda gösterdğinden tedavi modalitesinin belirlenmesinde önemli.
  - Vaskuler yaralanmaların gösterilmesinde avantaj sağlar.
  - ORAL kontrast verelim mi?
    - Amerikan Radyoloji Cemiyetine göre gerek YOK!

Eur J Radiol. 2015 Jun;84(6):1212-8. doi: 10.1016/j.ejrad.2015.02.015. Epub 2015 Mar 3.

The value of precontrast thoraco-abdominopelvic CT in polytrauma patients.

Esposito AA1, Zilocchi M2, Fasani P3, Giannitto C4, Maccagnoni S5, Maniglio M6, Campoleoni M7, Brambilla R8, Casiraghi E9, Biondetti PR10.

Abstract

PURPOSE:

To evaluate the utility and radiation dose of thoraco-abdominopelvic precontrast CT in polytrauma patients.

MATERIALS AND METHODS:

We examined retrospectively 125 patients who underwent a thoraco-abdominopelvic CT for trauma. Two radiologists, independently, evaluated precontrast CT acquisition and two other radiologists examined the contrast-enhanced scans. A further two radiologists assessed both the acquisitions. Mean value of sensitivity (SE), specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) were calculated by each group of radiologists. For 104 patients, CTDIvol, DLP data and individual mean size were collected to calculate effective dose.

RESULTS:

Mean values of SE, SP, PPV and NPV of findings of radiologists who assessed contrast-enhanced acquisitions were respectively: SE=85%, SP=98%, PPV=86%, NPV=88% versus: SE=43%, SP=95%, PPV=69%, NPV=88% of radiologists who examined non-contrast-enhanced scans. Mean values of radiologists who analyzed both acquisitions were: SE=80%, SP=97%, PPV=80%, NPV=88%. **Neither the precontrast scans nor the precontrast and postcontrast scans together provided additional useful information compared to the single contrast-enhanced acquisition.** Patients received a mean dose of 12 mSv for the precontrast CT.

CONCLUSIONS:

Precontrast CT acquisition did not provide significant information in trauma patients, exposing them to an unjustified radiation dose.

Penetran travmada kontrast endikasyonları

- **3'lü kontrastlı BT**
  - IV, oral, rektal
  - Tedaviyi değiştirir mi?
    - Perionit bulgusu olmayan seçilmiş hastalarda.
    - İzlem ve yakın takip gerekli.

https://www.google.com.tr/imgres?imgurl=https%3A%2F%2Fimage.slidesharecdn.com%2Fcase-presentation-uth-em-aug

J Trauma. 2001 Nov;51(5):860-8; discussion 868-9.

Determining the need for laparotomy in penetrating torso trauma: a prospective study using triple-contrast enhanced abdominopelvic computed tomography.

Chiu WC1, Shanmuganathan K, Mirvis SE, Scalea TM.

BACKGROUND:

The nontherapeutic laparotomy rate in penetrating abdominal trauma remains high and the morbidity rate in these cases is approximately 40%. Selective management, rather than mandatory laparotomy, has become a popular approach in both stab wounds and gunshot wounds. The advent of spiral technology has stimulated a reassessment of the role of computed tomography (CT) in many aspects of trauma care. We prospectively investigated the current utility of triple-contrast CT as a diagnostic tool to facilitate initial therapeutic management decisions in penetrating torso trauma.

METHODS:

We studied hemodynamically stable patients with penetrating injury to the torso (abdomen, pelvis, flank, back, or lower chest) without definite indication for laparotomy, admitted to our trauma center during the 1-year period from 7/99 through 6/00. Patients underwent triple-contrast enhanced spiral CT as the initial study. A positive CT scan was defined as any evidence of peritoneal violation (free air or fluid, contrast leak, or visceral injury). Patients with positive CT, except those with isolated solid viscus injury, underwent laparotomy. Patients with negative CT were observed.

RESULTS:

There were 75 consecutive patients studied: mean age 30 years (range 15-85 years); 67 (89%) male; 41 (55%) gunshot wound, 32 (43%) stab wound, 2 (3%) shotgun wound; mean admission systolic blood pressure 141 mm Hg (range 95-194 mm Hg); 26 (35%) had positive CT and 49 (65%) had negative CT. In patients with positive CT, 18 (69%) had laparotomy: 15 therapeutic, 2 nontherapeutic, and 1 negative. Five patients had isolated hepatic injury and 2 had hepatic and diaphragm injury on CT and all were successfully managed without laparotomy. Of these seven patients, three had angioembolization and two had thoracoscopic diaphragm repair. In patients with negative CT, 47/49 (96%) had successful nonoperative management and 1 had negative laparotomy. The single CT-missed peritoneal violation had a left diaphragm injury at laparotomy. CT accurately predicted whether laparotomy was needed in 71/75 (95%) patients.

CONCLUSION:

In penetrating torso trauma, triple-contrast abdominopelvic CT can accurately predict need for laparotomy, exclude peritoneal violation, and facilitate nonoperative management of hepatic injury. Adjunctive angiography and investigation for diaphragm injury may be prudent.

Tüm stabil hastalara BT çekelim mi?

- YETİŞKİNLERDE
  - GKS < 14
  - Kostal marjinde hassasiyet
  - Abdominal hassasiyet
  - Femur kırığı
  - Hematüri (>25 rbc)
  - Hematokrit seviyesi <%30
  - Anormal PAAG (pnomotoraks veya kot kırığı)
- *Eğer hastada herhangi biri varsa riskli sayılır ve BT gerekir!*
- *Hiçbiri yoksa BT'den fayda görmez!*

Adapted from Holmes JF, Wisner DH, McGahan JP, et al. Clinical prediction rules for identifying adults at very low risk for intraabdominal injuries after blunt trauma. Ann Emerg Med 54:575-584, 2009.

Tüm stabil hastalara BT çekelim mi?

- PEDİATRİK GRUPTA
  - Yaşına göre SKB' nın düşük olması
  - Abdominal hassasiyet
  - Femur kırığı
  - Karaciğer enzimlerinde artma (AST >200U/L, ALT >125U/L)
  - Mikroskobik hematüri (>5 rbc)
  - Hematokrit seviyesi <%30
- *Eğer hastada herhangi biri varsa riskli sayılır ve BT gerekir!*
- *Hiçbiri yoksa BT'den fayda görmez!*

Adapted from Holmes JF, Wisner DH, McGahan JP, et al. Clinical prediction rules for identifying adults at very low risk for intraabdominal injuries after blunt trauma. Ann Emerg Med 54:575-584, 2009.

J Pediatr Surg. 2013 Jun;48(6):1377-83. doi: 10.1016/j.jpedsurg.2013.03.038.

The role of focused abdominal sonography for trauma (FAST) in pediatric trauma evaluation.

Scaife ER1, Rollins MD, Barnhart DC, Downey EC, Black RE, Meyers RL, Stevens MH, Gordon S, Prince JS, Battaglia D, Fenton SJ, Plumb J, Metzger RR.

PURPOSE:

With increasing concerns about radiation exposure, we questioned whether a structured program of FAST might decrease CT use.

METHODS:

All pediatric trauma surgeons in our level 1 pediatric trauma center underwent formal FAST training. Children with potential abdominal trauma and no prior imaging were prospectively evaluated from 10/2/09 to 7/31/11. After physical exam and FAST, the surgeon declared whether the CT could be eliminated.

RESULTS:

Of 536 children who arrived without imaging, 183 had potential abdominal trauma. FAST was performed in 128 cases and recorded completely in 88. In 48% (42/88) the surgeon would have elected to cancel the CT based on the FAST and physical exam. One of the 42 cases had a positive FAST and required emergent laparotomy; the others were negative. The sensitivity of FAST for injuries requiring operation or blood transfusion was 87.5%. The sensitivity, specificity, PPV, and NPV in detecting pathologic free fluid were 50%, 85%, 53.8%, and 87.9%.

CONCLUSIONS:

True positive FAST exams are uncommon and would rarely direct management. While the negative FAST would have potentially reduced CT use due to practitioner reassurance, this reassurance may be unwarranted given the test's sensitivity

BT normalse, güvenle taburcu edilebilir mi?

- ?
- Barsak, mezenter ve diyafram yaralanmaları atlanabilir!
- Yatış gerekmese de, klinik izlem önemli.

Gebe travmada görüntüleme

- Tek seferlik abdominal veya pelvik BT ile, teratojenik risk oluşturacak radyasyon eşiği AŞILMAZ.
- Yinede yaralanma riski düşükse, alternatif yöntemlerle izlem..

ÖZET

- Direkt grafiler çoğu acil durumda yetersiz kalmakta.
- USG solid organlar ve pelvik patolojilerde faydalı bir tetkik,
  - Radyasyon içermez
  - Hasta başı uygulanabilir, unstabil travma hastalarında ideal.
- BT ayrıntılı görüntüleme imkanı sağlar
  - Kontrast ilişkili komplikasyon riski mevcut
  - Düşük riskli grupta klinik karar gerekir
  - Barsak ve diyafram yaralanmalarında sensitivitesi düşüktür

TEŞEKKÜRLER…