

EAU ABDOMINALE

Dr CHENAITIA Hichem
Médecin Urgentiste et échographiste

EAU Abdominale

- Difficile
 - Patient non à jeun (VB), Iléus réflexe
 - Écho au lit, mobilité réduite
 - Algique, coopération réduite
- Sonde Abdominale, possible avec sonde cardio et « preset » adapté
- Motif de consultation très fréquent

EAU pour vous ??

Diagnostic final (953 cas, tous passages aux urgences)

| Diagnostic final | Nombre | % |
|---|--------|-------|
| Douleur abdominale non spécifique* | 332 | 34,8 |
| Colique néphrétique | 106 | 11,10 |
| Appendicite aiguë | 71 | 7,45 |
| Occlusion intestinale aiguë | 64 | 6,70 |
| Cholécystites aiguës et infections hépato-biliaires | 58 | 6,10 |
| Affections gynécologiques | 59 | 6,15 |
| Infections urinaires | 49 | 5,15 |
| Pancréatite aiguë | 41 | 4,30 |
| Sigmoïdite/diverticulite | 36 | 3,80 |
| Hernie/éventration étranglée | 33 | 3,45 |
| Péritonite | 26 | 2,70 |
| Coliques hépatiques | 16 | 1,50 |
| Anévrismes | 4 | 0,40 |
| Ischémie intestinale | 6 | 0,65 |
| Rétention aiguë d'urine | 6 | 0,65 |
| Autres | 32 | 3,35 |

EAU pour vous ??

| | |
|-------------------------------|--------|
| Appendicite | 25-30% |
| Douleurs non spécifiques | 20-25% |
| Cholécystite, voies biliaires | 6% |
| Occlusions | 6% |
| Pancréatite aiguës | 4% |
| Sigmoïdite | 5% |
| Péritonite | 5% |
| Perforation | 5% |
| Eventration, hernies | 3% |
| Colique néphrétique | 5% |
| Pathologie vasculaire | 1% |
| anévrisme | |
| ischémie | |

EAU abdominale =

- ◉ Colique néphrétique
- ◉ Cholécystite
- ◉ AAA
- ◉ RAU

- ◉ Selon les études EAU entre 10 et 20% Dg
- ◉ Mais D non sp entre 25 et 35% Dg
- ◉ Et le reste = chirurgie (TDM ou Bio)

EAU Urologique

- ◉ Dilatation pyélo-calicielle
- ◉ Epanchement péri rénal
- ◉ Globe vésical

- ◉ Voir topo EAU urologique

VB et lithiase vésiculaire

- ◉ Lithiase vésiculaire: 8% hommes et 17% femmes

- ◉ Colique hépatique = motif de recours fréquent aux urgences

- ◉ Signe de Murphy présent dans la cholécystite ou colique hépatique

VB et lithiase vésiculaire

- ◉ Fièvre et hyperleucocytose présent dans 1/3 des cholécystites

- ◉ Echo utile pour le diagnostic et le TRI +++

- ◉ Peu étude dans la littérature (<10), pour l'EAU par des urgentistes

Clinique

- Douleur en HCD ou épigastrique ou du flanc droit
- Douleur abdominale en relation avec ingestion de nourriture (riche ou grasse)
- Douleur abdominale et fièvre
- Diagnostic différentiel avec CN du RD

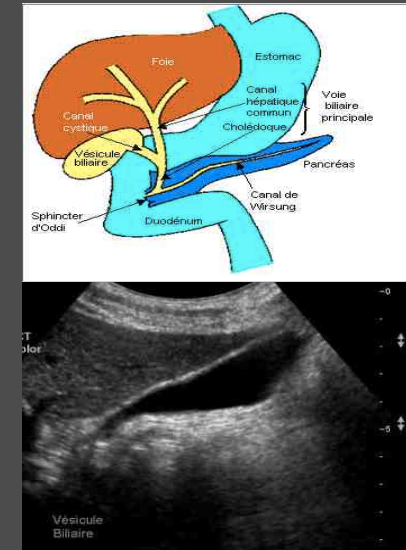
Anatomie

• VB est sous hépatique, oblongue, anéchogène ou vide, avec une paroi fine

• VB = col, corps et fond

• Volume varie en fonction de l'heure du dernier repas +++

• VB antérieur au RD



Cholécystite : critère Dg

- **Distension vésiculaire, diamètre longitudinale > 10 cm, DT > 4 cm**
- **Paroi épaissie > 4 mm**
- **Présence de lithiase ou « Sludge » (amas de micro lithiase)**
- **Murphy échographique**
- +/- épanchement péri cholécystite

VB : valeur examen écho

- **VPP**
 - Calcul + Murphy = 92%
 - Calcul + Paroi = 95%
- **VPN**
 - Ni calcul, ni Murphy = 97%
 - Ni calcul, ni Paroi = 98%
 - Ni calcul, ni Paroi, Ni Murphy = 99%

Pathologie



Pièges

- Air dans le duodénum peut mimer un calcul avec une ombre acoustique « sale »
- Kyste du pole sup du RD de grande taille peut mimer la VB
- Epaissement de la paroi de la VB dans l'ascite, l'hépatite, la pancréatite, hypoalbumiémie, HIV, IC
- Polype de la VB confondue avec lithiasie

Pièges

- Quand non vue, penser au post prandiale, VB scléro-atrophique sur calcul, penser à la cholécystectomie
- **TOUJOURS** refaire faire l'échographie par le radiologue (sans urgence), car l'évaluation des voies biliaire et du pancréas nécessite un avis d'expert

EBM : formation

J Emerg Med. 2010 Jul;39(1):65-9. doi: 10.1016/j.jemermed.2008.10.002. Epub 2009 Jan 26.

Emergency medicine resident performed bedside ultrasonography of the gallbladder in non-fasted healthy volunteers.

Breyer MJ, Giordano M, Tinjum B, Getto L, Rhodes N, Bollinger M, Sierzanski P, O'Connor RE.

Department of Emergency Medicine, Christiana Care Health System, Newark, Delaware 19718, USA.

Abstract

BACKGROUND: Gallbladder ultrasonography is a commonly performed test in the emergency department. It is unknown whether a non-fasting state alters the visualization of the gallbladder by emergency medicine (EM) residents.

OBJECTIVES: We conducted this study to determine whether EM residents are able to visualize the gallbladder in volunteers who have recently consumed a fatty meal.

METHODS: This study used a prospective, single-blinded, randomized controlled design. Initial scans were performed on fasting volunteers. A fatty meal was then consumed. Thirty minutes after eating, a different resident, who was unaware of whether the volunteer had eaten or fasted, performed a second scan. To control for operator bias, 10% of subjects remained fasting between scans. Student's paired-samples t-test, Pearson's chi-squared, and McNemar test were determined as appropriate.

RESULTS: A total of 92 scans from 46 volunteers were analyzed. EM residents were able to visualize the gallbladder in all 40 pre-prandial scans (100%) and all 40 post-prandial scans (100%). Gallbladder area as measured in the longitudinal axis decreased 20% from a mean baseline of 11.58 +/- 4.86 cm(2) (95% confidence interval [CI] 11.17-12.98) to 9.2 +/- 5.04 cm(2) (95% CI 7.74-10.66, p = 0.0009) after food intake. Total time to scan for the fasting volunteers (110.2 s, 95% CI 84.34-136) did not change significantly from non-fasting volunteers (129.7 s, 95% CI 110.29-149.01, p = 0.153).

CONCLUSIONS: EM residents are able to visualize the gallbladder in non-fasted healthy volunteers.

EBM Formation

[J Emerg Med. 2009 Jul;37\(1\):51-6. doi: 10.1016/j.jemermed.2007.10.070. Epub 2008 Apr 25.](#)

Learning curve of bedside ultrasound of the gallbladder.

[Gaspari RJ, Dickman E, Blehar D.](#)

Division of Emergency Ultrasound, Department of Emergency Medicine, University of Massachusetts School of Medicine, Worcester, Massachusetts, USA.

Abstract

Existing guidelines for the number of ultrasounds required before clinical competency are based not on scientific study but on consensus opinion. The objective of this study was to describe the learning curve of limited right upper quadrant ultrasound. This was a prospective descriptive study. Ultrasounds collected over 1 year were reviewed for interpretive and technical errors. Possible errors during bedside ultrasound of the gallbladder include incorrect interpretation, incomplete image acquisition, and improper or poor imaging techniques resulting in poor image quality. The ultrasound image quality was rated on a 4-point scale, with 1 = barely interpretable and 4 = excellent image quality. Required images were rated on an additional 4-point scale, with 4 = all required images were included and 1 = minimal images were recorded. There were 352 patients enrolled by 42 emergency physicians (35 residents and 7 attendings). Gallstones were identified in 13.9% of the patients, and 4.3% of the ultrasounds were indeterminate. Interpretive and technical error rates decreased as the clinician gained experience. The number of poor quality ultrasounds decreased after an average of seven ultrasounds. Inclusion of all required images increased after 25 ultrasounds. Sonographers who had performed over 25 ultrasounds showed excellent agreement with the expert over-read, with only two disagreements, both from a single individual. It was concluded that clinicians are clinically competent after performing 25 ultrasounds of the gallbladder.

EBM : colique hépatique

[West J Emerg Med. 2008 Jan;9\(1\):1-5.](#)

Accuracy of ED Bedside Ultrasound for Identification of gallstones: retrospective analysis of 575 studies.

[Scruggs W, Fox JC, Potts B, Zildenny A, McDonough J, Anderson CL, Larson J, Barajas G, Langdorf MI.](#)

Department of Emergency Medicine, University of California Irvine, School of Medicine.

Erratum in

West J Emerg Med. 2008 May;9(2):129. McDonough, Joanne [corrected to McDonough, JoAnne].

Abstract

STUDY OBJECTIVE: To determine the ability of emergency department (ED) physicians to diagnose cholelithiasis with bedside ultrasound.

METHODS: ED gallbladder ultrasounds recorded over 37 months were compared to radiology ultrasound interpretation.

RESULTS: Of 1,690 ED gallbladder ultrasound scans performed during this period, radiology ultrasound was performed in 575/1690 (34%) cases. ED physician bedside interpretation was 88% sensitive [95% CI, 84-91] and 87% specific [95% CI, 82-91], while positive predictive value (PPV) was 91% [88-94%] and negative predictive value (NPV) was 83% [78-87%], using radiology interpretation as the criterion reference.

CONCLUSION: ED physician ultrasound of the gallbladder for cholelithiasis is both sensitive and specific.

EBM : cholécystite

[Ann Emerg Med. 2010 Aug;56\(2\):114-22.](#)

A prospective evaluation of emergency department bedside ultrasonography for the detection of acute cholecystitis.

[Summers SM, Scruggs W, Menchine MD, Lahham S, Anderson C, Amr O, Lotfipour S, Cusick SS, Fox JC.](#)

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Abstract

STUDY OBJECTIVE: We assess the diagnostic accuracy of emergency physician-performed bedside ultrasonography and radiology ultrasonography for the detection of cholecystitis, as determined by surgical pathology.

METHODS: We conducted a prospective, observational study on a convenience sample of emergency department (ED) patients presenting with suspected cholecystitis from May 2006 to February 2008. Bedside gallbladder ultrasonography was performed by emergency medicine residents and attending physicians at an academic institution. Emergency physicians assessed for gallstones, a sonographic Murphy's sign, gallbladder wall thickness, and pericholecystic fluid, and the findings were recorded before formal imaging. The test characteristics of bedside and radiology ultrasonography were determined by comparing their respective results to pathology reports and clinical follow-up at 2 weeks.

RESULTS: Of the 193 patients enrolled, 189 were evaluated by bedside ultrasonography. Forty-three emergency physicians conducted the ultrasonography, and each physician performed a median of 2 tests. After the bedside ultrasonography, 125 patients received additional radiology ultrasonography. Twenty-six patients underwent cholecystectomy, 23 had pathology-confirmed cholecystitis, and 163 were discharged home to follow-up. Twenty-five were excluded (23 lost to follow-up and 2 unavailable pathology). The test characteristics of bedside ultrasonography were sensitivity 87% (95% confidence interval [CI] 66% to 97%), specificity 82% (95% CI 74% to 88%), positive likelihood ratio 4.7 (95% CI 3.2 to 6.9), negative likelihood ratio 0.16 (95% CI 0.06 to 0.46), positive predictive value 44% (95% CI 29% to 59%), and negative predictive value 97% (95% CI 93% to 99%). The test characteristics of radiology ultrasonography were sensitivity 83% (95% CI 61% to 95%), specificity 86% (95% CI 77% to 92%), positive likelihood ratio 5.7 (95% CI 3.3 to 9.8), negative likelihood ratio 0.20 (95% CI 0.08 to 0.50), positive predictive value 59% (95% CI 41% to 76%), and negative predictive value 95% (95% CI 88% to 99%).

CONCLUSION: The test characteristics of emergency physician-performed bedside ultrasonography for the detection of acute cholecystitis are similar to the test characteristics of radiology ultrasonography. Patients with a negative ED bedside ultrasonography result are unlikely to require cholecystectomy or admission for cholecystitis within 2 weeks of their initial presentation.

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EBM

[Am J Emerg Med. 2001 Jan;19\(1\):32-6.](#)

Ultrasonography by emergency physicians in patients with suspected cholecystitis.

[Rosen CL, Brown DF, Chang Y, Moore C, Averill NJ, Arkoff LJ, McCabe CJ, Wolfe RE.](#)

Department of Emergency Medicine, Beth Israel Deaconess Medical Center and The Division of Emergency Medicine, Harvard Medical School, Boston, MA 02215, USA, crosen2@caregroup.harvard.edu

Abstract

This article investigates the use of bedside abdominal ultrasonography (BAU) performed by emergency physicians (EPs) to screen patients for cholelithiasis and cholecystitis. In this prospective study EPs performed BAU on 116 patients. Agreement between BAU and formal abdominal ultrasound (FUS) performed in the radiology department for detecting cholelithiasis and cholecystitis was determined using Kappa statistics. Test characteristics of BAU for detecting cholelithiasis and acute cholecystitis were calculated. Agreement between BAU and FUS was 0.71 for cholelithiasis and 0.46 for acute cholecystitis. Test characteristics of BAU for cholelithiasis were sensitivity 92%, specificity 78%, positive predictive value (PPV) 86%, negative predictive value (NPV) 88%. Test characteristics of BAU for acute cholecystitis compared with clinical follow-up were sensitivity 91%, specificity 66%, PPV 70%, NPV 90%. BAU may be used to exclude cholelithiasis and is sensitive for cholecystitis. However, when EPs with limited experience identify cholecystitis a confirmatory test is warranted before cholecystectomy.

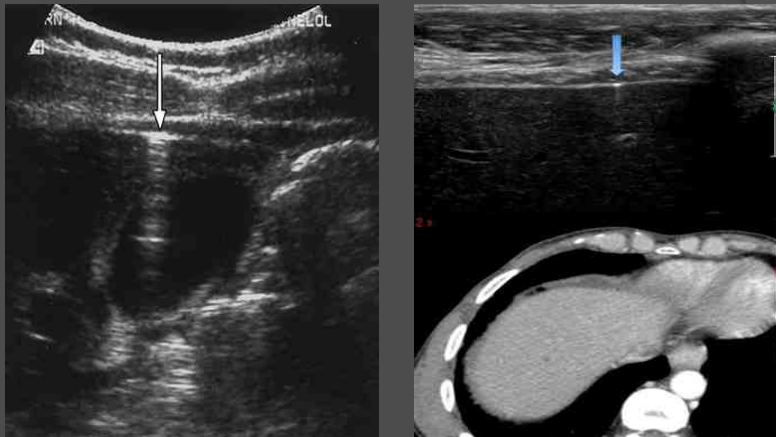
VBIH et VBEH

- Aucune littérature +++, pas EBM +++
- Difficile, risqué et perte de temps
- Angiocholite diagnostic clinico-biologique
- Nécessite une écho spécialisé, sanction CPRE

Tronc porte

- Aucune littérature +++, pas EBM +++
- Difficile, risqué et perte de temps
- Echo spécialisé : taille, sens du flux, vitesse, thrombus, étude surtout dans les hépatopathies chronique

Pneumopéritoine, le mythe ?



Pneumopéritoine



Cas cliniques

Acad Emerg Med. 2011 Mar;18(3):e30. doi: 10.1111/j.1553-2712.2010.00671.x.

Emergency ultrasound identification of pneumoperitoneum.

Stone MB, Papanagnou D.

Department of Emergency Medicine SUNY Downstate/Kings County Hospital Center Brooklyn, NY, USA. drmikestone@gmail.com

Am J Emerg Med. 2007 Sep;25(7):838-41.

Recognition of pneumoperitoneum using bedside ultrasound in critically ill patients presenting with acute abdominal pain.

Jones R.

Department of Emergency Medicine, MetroHealth Medical Center, Cleveland, OH 44109, USA.

Abstract

Bedside ultrasound examinations performed by emergency physicians are goal-directed studies meant to answer specific questions. These studies are frequently performed in critically ill patients with undifferentiated abdominal pain who are suspected of having intra-abdominal hemorrhage or a ruptured abdominal aortic aneurysm. Patients presenting with a perforated hollow viscus may have a similar clinical presentation. Although detection of the sonographic findings associated with a perforated hollow viscus is not a current study goal, these findings may be readily apparent during the performance of examinations to detect an abdominal aortic aneurysm or intra-abdominal hemorrhage. Therefore, it is imperative that emergency physicians be familiar with the sonographic findings associated with a perforated hollow viscus. Three illustrative cases are presented with a review of sonographic findings.

Série de cas

Ultraschall Med. 1982 Mar;3(1):4-6.

[Ultrasound detection of free air in the abdominal cavity].

[Article in German]

Seitz K, Reising KD.

Innere Abteilung, Kreiskrankenhaus Böblingen.

Abstract

Diagnosis via x-ray film had so far been the only way to prove the existence of free air in the abdominal cavity and hence the presence of gastrointestinal perforation. However, it is possible to establish the existence of free air in the abdomen sonographically provided a suitable examination method is employed. A characteristic feature is represented by pronounced pre-hepatic echoes with multiple echoes or sound shadow phenomenon. Experimentally it was possible to identify 1 ml air in the abdomen of an ascites patient both by x-ray examination and by sonography with equal certainty. The clinical usefulness of the ultrasound method was scrutinized. Of 10 patients with gastrointestinal perforations, 9 were recognized by sonography, including roentgen-negative cases; in one case only, sonography yielded a false negative result. Sonographic differential diagnosis is more versatile and differentiation can be practised by the highly experienced investigator only. The proof of the existence of free air in the abdomen represents a considerable extension of the scope of sonographic emergency-case diagnosis.

1 seule étude en 2002 !!!

Acad Emerg Med. 2002 Jun;9(6):643-5.

Selective use of ultrasonography for the detection of pneumoperitoneum.

Chen SC, Wang HP, Chen WJ, Lin FY, Hsu CY, Chang KJ, Chen WJ.

Department of Emergency Medicine, National Taiwan University Hospital, Taipei, Taiwan. scc@ha.mc.ntu.edu.tw

Abstract

OBJECTIVE: Whether ultrasonography is superior to plain radiography for the detection of pneumoperitoneum is unknown. The goal of this study was to determine the value of ultrasonography for the detection of pneumoperitoneum.

METHODS: One hundred thirty-two patients with suspected hollow-organ perforation were prospectively selected for study. All 132 patients received ultrasonography, upright chest radiography, and left lateral decubitus abdominal radiography examinations. The diagnostic accuracies of chest and abdominal radiographs for the detection of pneumoperitoneum were compared with corresponding values from ultrasonography.

RESULTS: Of the 125 patients who underwent laparotomy, 121 patients had hollow-organ perforation, three patients had perforated appendicitis, and one patient had acute cholecystitis. For the diagnosis of pneumoperitoneum, ultrasonography demonstrated a sensitivity of 93%, a specificity of 64%, a positive predictive value of 97%, a negative predictive value of 44%, and an accuracy of 90%. Plain radiography revealed a sensitivity of 79%, a specificity of 64%, a positive predictive value of 96%, a negative predictive value of 21%, and an accuracy of 77%.

CONCLUSIONS: Ultrasonography is a more sensitive diagnosing modality than plain radiography for the diagnosis of pneumoperitoneum. The authors suggest that ultrasonography was a useful diagnostic modality when plain radiographs failed to reveal pneumoperitoneum among patients with suspected hollow-organ perforation.

AAA

- AAA = diamètre > 3 cm
- AAA sacciforme -- ou fusiforme +++
- Examen clinique non pertinent (Se=68%) (si rupture: Se=50%)
- Echo = excellente Se et Sp

Introduction

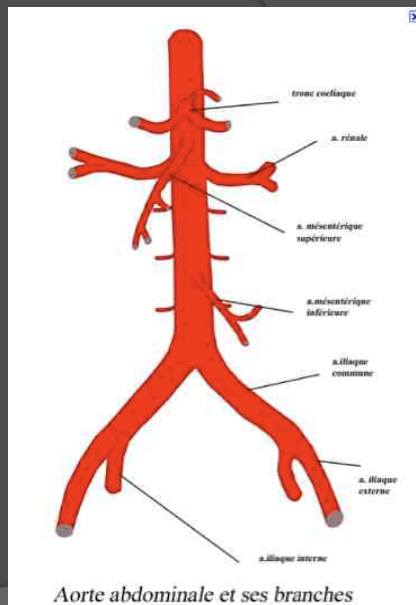
- > 65 ans = 4 à 8% H / 0,5 à 1,5% F
- 10% H fumeur > 65 ans
- 10% AAA > 5 cm
- Rupture de l'AAA : Mortalité > 80% et 80% AAA non connues

Indication

- ACEP : choc, hypotension, douleur abdominale, masse abdominale, douleur des flancs ou du dos
- Systématique lors d'une écho abdo chez les patients de plus de 65 ans ou > 50 ans avec fdr Cvx
- En résumé = systématique si écho abdo

Anatomie

- Aorte abdominale mesure 13 cm, hiatus aortique du diaphragme (T12) avec une bifurcation autour de l'ombilic (L4)
- Branches : Art coélique, AMS, art rénales (AMI non visible à l'écho)



Pathologie



Pièges

- ⊙ **Thrombus** : image trompeuse avec un calibre pseudo normal
- ⊙ **Calibre transverse** parfois supérieur au calibre antéropostérieur
- ⊙ Hématurie, possible AAA (P° Vn rénale)
- ⊙ Anévrisme sacciforme manqué à cause des gaz, **savoir dire que l'aorte n'a pas été vue complètement**

EBM : plein d'études +++

Emerg Med J 2007;24:547-549. doi: 10.1136/emj.2007.048405

Objective: To establish whether UK emergency physicians could reliably perform focused ultrasound of the abdominal aorta in patients with suspected abdominal aortic aneurysm (AAA).

Methods: A prospective cohort study was conducted in the emergency department of a tertiary level UK teaching hospital. All patients who underwent an abdominal aortic ultrasound by an emergency physician during a 12 month period from January to December 2005 were included. The principle outcomes were presence of an AAA (external wall diameter >3 cm) or death from ruptured AAA. Outcome data were obtained from paper and electronic patient records and primary care telephone follow up.

Results: 120 focused ultrasound scans looking for AAA were performed by 19 different UK emergency physicians of various grades. Of the 120 scans, 26 (22%) were positive for an AAA, of which 17 cases represented a new diagnosis. Ruptured aneurysms represented 46% (12/26) of all positive scans, of which four patients underwent emergency repair. In the remaining 14 patients the AAA was an incidental finding that was not the reason for their presentation to the emergency department. Emergency ultrasound had a sensitivity of 96.3% (95% confidence interval (CI) 81.0% to 99.9%); a specificity of 100% (95% CI 91.8% to 100%); a negative predictive value of 98.6% (95% CI 88.0% to 99.9%); and positive predictive value of 100% (95% CI 86.8% to 100%) for the detection of AAA.

Conclusion: Emergency ultrasound scanning by UK emergency physicians has high sensitivity and specificity for identifying AAA, consistent with international experience.

EBM : ACEP « review » 2013

Acad Emerg Med, 2013 Feb;20(2):128-38. doi: 10.1111/acem.12080.

Systematic review: emergency department bedside ultrasonography for diagnosing suspected abdominal aortic aneurysm.

Rubano E, Mehta N, Caputo W, Paladino L, Sinert R.

Department of Emergency Medicine, SUNY Downstate Medical Center, Brooklyn, NY, USA.

Abstract

BACKGROUND: The use of ultrasound (US) to diagnose an abdominal aortic aneurysm (AAA) has been well studied in the radiology literature, but has yet to be rigorously reviewed in the emergency medicine arena.

OBJECTIVES: This was a systematic review of the literature for the operating characteristics of emergency department (ED) ultrasonography for AAA.

METHODS: The authors searched PubMed and EMBASE databases for trials from 1965 through November 2011 using a search strategy derived from the following PICO formulation: Patients-patients (18+ years) suspected of AAA. Intervention-bedside ED US to detect AAA. Comparator-reference standard for diagnosing an AAA was a computed tomography (CT), magnetic resonance imaging (MRI), aortography, official US performed by radiology, ED US reviewed by radiology, exploratory laparotomy, or autopsy results. AAA was defined as ≥ 3 cm dilation of the aorta. Outcome-operating characteristics (sensitivity, specificity, and likelihood ratios [LR]) of ED abdominal US. The papers were analyzed using Quality Assessment of Diagnostic Accuracy Studies (QUADAS) guidelines.

RESULTS: The initial search strategy identified 1,238 articles; application of inclusion/exclusion criteria resulted in seven studies with 655 patients. The weighted average prevalence of AAA in symptomatic patients over the age of 50 years is 23%. On history, 50% of AAA patients will lack the classic triad of hypotension, back pain, and pulsatile abdominal mass. The sensitivity of abdominal palpation for AAA increases as the diameter of the AAA increases. The pooled operating characteristics of ED US for the detection of AAA were sensitivity 99% (95% confidence interval [CI] = 96% to 100%) and specificity 98% (95% CI = 97% to 99%).

CONCLUSIONS: Seven high-quality studies of the operating characteristics of ED bedside US in diagnosing AAA were identified. All showed excellent diagnostic performance for emergency bedside US to detect the presence of AAA in symptomatic patients.