Letter to the editor

Dear Editor,

Re: From systematic XR interpretation to plain abdominal XR

With the commencement of July in 2015, another intake of new clinical staff to Emergency Departments (ED) in the Northern Hemisphere including Hong Kong has occurred. On one hand, it is the new force. While on the other, it can be a hazard in the clinical services when supervisory input is insufficient owing to man-power shortage since expertise requires time to grow.

The contribution of Hong Kong EDs to medical undergraduate education has been accelerating in the past decade. In collaboration with the medical students, we have worked out a new set of Acronyms from Chest, Musculoskeletal to Abdominal Plain XR to help students & young doctors to develop a systematic reading & interpretation of the common XR imaging in the ED.

In Resuscitology, including & not limited to Traumatology, the ABC are useful mnemonic to guide the assessment & treatment priority.[1] The ATLS Course has provided the A-A B C D S for CXR &

Spinal XR interpretation.[2] Now, 'E' has been added to indicate the need to check for "Everything within the 4 margins of the PACS image" so as not the miss the subtle details from external foreign bodies to artefacts affecting the interpretation.

Plain AXR is even more difficult to read owing to multiple overlapping bowel shadows & the obese abdominal wall in many patients.

In the 'A-A B C D E S' acronym (see Table 1),[3] the first 'A' stands for "Adequacy of the imaging". The second 'A' represents Air, stressing the importance to check for (but not sensitive enough to rule out) Pneumoperitoneum, which is evidently an important pathology in acute abdomen. Certainly, the best combination of plain XR imaging for abdomen is Erect CXR (free gas under diaphragm) with Supine AXR. In the Supine AXR, Pneumoperitoneum signs encompass the football sign,[4] subphrenic free gas, gas outlying the falciform ligament & ligamentum teres & the Rigler sign (gas on both sides of the bowel wall).[5] Surgical or subcutaneous emphysema is another 'Air' indicating gas-producing bacterial infection or penetrating trauma. 'B' means Bowel. The bowel shadow distribution, extent, caliber & distension information guide the diagnosis to bowel obstruction

Table 1. Plain X-ray reading systems - chest (CXR), musculo-skeletal (MSK) and abdominal (AXR)[3]

Acronym	CXR	MSK	AXR
A		Adequacy	
A	Airway	Alignment	Air / Free Gas
B	Breathing	Bone	Bowel
C	Circulation	Cartilage	Calcification & Stones
D	Diaphragm	Disk	Diaphragms
E	Everything within the 4 margins		
S	Soft Tissue	Soft Tissue / Fat Pads	Psoas / Emphysema
S	Spine / Ribs	–	Spine / Pelvic Bone / Lower Ribs

or displacement by intra-abdominal masses. 'C' indicates Calcification & Calculi or Stones from radio-opaque gall stones, urolithiasis, pancreatic stones crossing the midline, para-vertebral curvilinear calcification pointing to AAA. 'D' refers to the Diaphragm, focusing on the contour (clear, any discontinuity), level (displacement) and continuous diaphragmatic sign (pointing to Pneumoperitoneum). 'E' is "Everything within the 4 margins of the image", reminding the clinicians not to miss subtle radio-opaque foreign bodies & artefacts, not to mention the patient identification and body side marker right at the beginning of the 'Adequacy' checking. 'S' signifies "Soft Tissue Shadow / Swelling" & "Skeleton or Spine". Checking the contour & symmetry of the psoas muscles can help elucidate if there is any obliteration, pointing to psoas abscess or AAA with retroperitoneal rupture. Other gross soft tissue masses may indicate intra-peritoneal or pelvic lesions though not sensitive. "Skeleton or Spine" reminds the readers to check for any associated pelvic bone or vertebral (pedicles vs. body) lesions (osteolytic or sclerotic) as the important abdominal pain mimickers. Definitely, the focal XR +/- subsequent CT of the bony lesions would be necessary.

With this re-organised concept of AXR reading, the medical students & young ED doctors should be able to develop a structured interpretation to attain a quicker & more accurate diagnosis by the clinico-imaging correlation.

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