To V/Q or to Spiral CT?  
That is the Question

Questions & Answers

1. What are the benefits of using a V/Q scan on suspected pulmonary embolism patients?

Ventilation perfusion scans are an excellent test for ruling out pulmonary embolism (PE). A normal ventilation/perfusion (V/Q) scan has a sensitivity of 98%. A low clinical probability combined with a low probability V/Q scan has a 4% likelihood of being a PE. A high clinical probability combined with a high probability V/Q scan is 95% likely to be PE. The radiation from a V/Q scan is low. The contrast used is not iodine-based, Technetium-99m or Xenon-133, so there is less end-organ damage or risk of allergic reaction.

2. What are the disadvantages of using a V/Q scan on suspected PE patients?

Scans that are not either (a) normal, (b) low probability V/Q scan combined with low clinical probability, or (c) high probability V/Q scan and high clinical probability are non-diagnostic. Therefore, up to 72% of V/Q scans are non-diagnostic. Non-diagnostic V/Q scans do not help determine alternate diagnoses and alternate diagnoses are still possible with diagnostic scans. The patient must have the ability to breathe deeply for full lung distribution of the contrast, so patients with decreased respiratory function (such as COPD sufferers) may not be good candidates. Patients need to have a chest radiograph to compare to the V/Q scan, so patients with known or pre-existing lung pathology may be difficult to interpret.
3. **What are the benefits of using a spiral CT scan to diagnose a PE?**

The sensitivity of a spiral CT scan is 83% and the specificity is 96%. Spiral CT scans have the ability to visually see exact locations of emboli and are accurate at diagnosing large emboli. Spiral CT scans are able to provide alternate diagnoses, such as lung abscesses, pneumothoraces, pleural and pericardial effusions and allow for retrospective reconstructions. Spiral CT is readily available to physicians in many regions and is a relatively rapid test to complete.

4. **What are the disadvantages of using spiral CT scan to diagnose a PE?**

If a filling defect is confined to a subsegmental vessel, it is not diagnostic. A normal spiral CT scan does not rule out a small PE. Contrast may be problematic in patients with an allergy or renal insufficiency. Spiral CT scans must be read by an expert and are expensive:

- D-dimer (DD) + ultrasound (US) + V/Q = $845
- DD + US + spiral CT = $1230 for low clinical probability

Spiral CT scans give significant radiation exposure, equivalent to about 53 chest radiographs. Spiral CT gives 10 mGy to 50 mGy of radiation compared to the 0.28 mGy of radiation from V/Q scans.

To diagnose a PE, it is necessary to determine the patient’s probability of a PE using a scale, such as the Modified Wells’ Criteria.

Symptoms of a PE include:

- dyspnea,
- pleuritic chest pain,
- cough and
- hemoptysis.

Signs of PE include:

- tachypnea,
- rales,
- tachycardia,
- fourth heart sound,
- accentuated P2 heart sound and in extreme cases,
- circulatory collapse.
5. Which case should have which test?

Victoria should start with V/Q scan. Her modified Wells’ score is zero, so she has a low clinical probability of having a PE. Victoria is a good V/Q candidate because she is young and active. She has the capacity to breathe deeply enough for the scan and you would want to minimize her radiation exposure. It is unlikely that Victoria has a PE so a V/Q should rule out a PE from the diagnosis.

Cameron should start with a spiral CT scan. His modified Wells’ Criteria score is 4.5. He has a moderate clinical probability of having a PE. By going directly to the spiral CT scan we would be able to quickly confirm or exclude a PE.

Resources

More on the cases

Victoria
Victoria was sent for a V/Q scan which showed normal ventilation and perfusion. PE was felt to be ruled out as a cause for her symptoms, which resolved spontaneously within a few days.

Cameron
Cameron was sent for spiral CT which was positive for PE. He was started on low molecular weight heparin and consulted to hematology, who recommended his warfarin therapy and recommended that he remain on it for life.

MICARDIS® PLUS is now available in an 80 mg/25 mg formulation.

For further information, please contact your MICARDIS® PLUS representative.

MICARDIS® PLUS (80 mg telmisartan/25 mg hydrochlorothiazide) is indicated for the treatment of patients whose blood pressure is not adequately controlled by MICARDIS® PLUS 80 mg/12.5 mg, or patients who have been previously stabilized on telmisartan and hydrochlorothiazide given separately. The overall incidence and pattern of adverse events reported with MICARDIS® PLUS (80 mg/25 mg) was comparable with MICARDIS® PLUS (80 mg/12.5 mg). Observed adverse events reported with MICARDIS® PLUS (80 mg/12.5 mg) with an incidence of >2% were fatigue, pain, dizziness, headache, diarrhea, and upper respiratory tract infection.

In case of rare hereditary conditions of fructose or galactose intolerance, the use of the product MICARDIS® PLUS is contraindicated.

If pregnancy is detected, MICARDIS® PLUS should be discontinued as soon as possible. In patients who are volume depleted by diuretic therapy, dietary salt restriction, dialysis, diarrhea or vomiting, symptomatic hypotension may occur after initiation of therapy with MICARDIS® PLUS. The fixed-dose combination is not indicated as initial therapy. Due to the hydrochlorothiazide component, MICARDIS® PLUS is contraindicated in patients with anuria or hypersensitivity to other sulfonamide-related drugs.

For further information, please refer to the Product Monograph.