

EMBOLIC STROKE OF UNDETERMINED SOURCE (ESUS)

Conditions associated with ESUS

- Subclinical atrial fibrillation
- Atrial cardiopathy
- Unrecognized myocardial infarction
- PFO/ASD
- Cancer
- Nonstenosing large-artery atherosclerosis
- Nonatherosclerotic vasculopathies
 - Dissection of the cervicocephalic arteries (recent neck trauma or respiratory infections)
 - Infectious and inflammatory vasculopathies

Initial evaluation

When there is a clinical suspicion for a cardioembolic source and the source is undetermined, the next step is to perform an evaluation starting with:

- TTE with bubble
- Continuous EKG monitoring

Management

- The acute management of ESUS within the first 48 hours is like any other acute ischemic stroke including no systemic anticoagulation.
- The management of ESUS after the first 48 hours is more controversial.
 - Although, it is intuitive to treat ESUS with anticoagulation, it remains unclear whether anticoagulation is superior to antiplatelet therapy for secondary prevention of stroke in patients with:
 - Normal TEE with bubble
 - At least 30 days ambulatory cardiac monitoring
 - Carotid Doppler
 - Low CHA₂DS₂-VASc score
 - No old MI and no cancer
 - The available RCT data does not support the use of anticoagulation compared to ASA in this subset of patients, however, the negative result in the available trials could be explained by the wide heterogeneity of ESUS included in the trials
- Consider placement of implantable loop recorder
 - For patients with ≥ 18 of cardiac telemetry with no evidence of AFib/Flutter, not on anticoagulation and able to comply with long-term outpatient follow-up
- Consider left atrial appendage occlusion device
 - For patient's suitable for at least 6 weeks of anticoagulation but not a good candidate for long-term anticoagulation

PFO ASSOCIATED STROKE

- Antiplatelet therapy

- Closure of the PFO/ASD after a comprehensive evaluation to rule out other stroke etiologies in patients who meet the following criteria using the PASCAL classification system which incorporate the RoPE score and high-risk features of the PFO/ASD:
 - Age \leq 60 years
 - RoPE score $>$ 6
 - PFO/ASD with a large shunt or ASD
 - No indication for anticoagulation therapy otherwise