Fitzpatrick ECG algorithm for the localization of Accessory Pathways - 2010

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Fitzpatrick et al (1) propose an algorithm for AP localization using ECG.

Stepwise discriminant analysis was used to assess the relation of 18 pre-excited ECG (QRS duration > 100 ms) variables to the site of successful ablation in 93 patients. The most discriminating variables were combined to form rules for each location.

The ECGs were retested by these rules to determine predictive accuracy. If the precordial QRS transition was at or before lead V1, the AP had been ablated on the left side. If it was after lead V2, the AP had been ablated on the right side.

If the QRS transition was between leads V1 and V2 or at lead V2, then if the R wave amplitude in lead I was greater than the S wave by ≥ 1.0 mV, it was right-sided; otherwise, it was left-sided Right-side APs.

If the QRS transition was between leads V2 and V3, the AP was right septal; if after lead V4, it was right lateral. If it was between leads V3 and V4, then if the d wave amplitude in lead II was ≥ 1.0 mV, it was right septal; otherwise, it was right lateral. In right lateral locations, if the d wave frontal axis was ≥ 0 degrees, or if it was < 0 degrees but the R wave amplitude in lead III was ≥ 0 mV, it was anterolateral; otherwise, it was posterolateral.

Anteroseptal pathways had a sum of d wave polarities in leads II, III and aVF ≥ +2. Posteroseptal pathways (inferior d wave sum ≤ -2) were less well discriminated from right midseptal pathways (inferior d wave sum < or = 1 > or = -1) Left-sided pathways. Two or more positive d waves in the inferior leads or the presence of an S wave

amplitude in lead aVL greater than the R wave, or both, discriminated left anterolateral AP from posterior APs.
If the R wave in lead I was greater than the S wave by ≥ 0.8 mV, and the sum of inferior d wave polarities was negative, the location was posteroseptal; otherwise, it was posterolateral.
Using the algorithm derived, a right-sided AP can be reliably distinguished from one that is left-sided, right free wall from right septal, right anterolateral from posterolateral and anteroseptal from other right septal pathways. Left anterolateral AP can be distinguished from left posterior AP and left posterolateral APs from left posteroseptal APs.

1. Fitzpatrick AP, Gonzales RP, Lesh MD, et al. New algorithm for the localization of accessory atrioventricular connections using a baseline electrocardiogram. J Am Coll Cardiol. 1994 Jan;23:107-116.