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P663

Is echocardiogram alone sufficient for cardiac masses characterization?

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BACKGROUND: Cardiac Masses (CM) represent an heterogeneous group with a prevalence of 0.3% at autopsy, divided in benign masses (primary tumors and pseudotumors) and malignant ones (primitive tumors and metastasis). 2-D Echocardiography is nowadays the first line approach to define nature and management of CM, but is it enough to guide a therapeutic strategy?

PURPOSE: To evaluate echocardiographic diagnosis accuracy for CM in patients admitted to our Centre between 1997 and 2017.

MATERIALS AND METHODS: We retrospectively evaluated a population of 180 consecutive patients (45% males; mean age 60 ± 16 years; BMI 25 ± 5 Kg/m2), referred to our echocardiographic lab with suspicion CM. All patients were examined in both left lateral and supine position, and heart was visualized from all available echocardiographic windows. Definite diagnosis was obtained by histologic examination of biopsy, surgical samples or, in cases of cardiac thrombi, by radiological evidence of thrombus resolution after adequate anticoagulant treatment. We excluded normal anatomical variants in the group of pseudotumors due to the impossibility of obtaining histological examination. Sensitivity, specificity, predictive accuracy for a positive test, and predictive accuracy for a negative test were calculated by standard formulas (corrected for prevalence by Bayes theorem).

RESULTS: We detected 129 benign CM and 51 malignant cardiac tumors. In 7 cases a poor acoustic window did not allow an optimal examination; in remaining 173 patients, the classical 2-D echocardiogram identified 157 masses with a diagnostic accuracy of 91%. Of 173 CM diagnosed, 146 were classified by echocardiographer as benign masses (125 true benign on histological examination) and 27 as malignant ones (all malignant after histological confirmation); the results showed 56% sensitivity, 100% specificity, 100% positive predictive value, 98% negative predictive value, with 88% overall diagnostic accuracy in identifying the nature of masses. 23 cases were undetermined and needed second level instrumental investigations to be characterized. Diagnostic accuracy for distinguishing primary benign tumors and pseudotumors decreased to 80%, with a significant increase in both "false" benign tumors (9 out of 91) and "false" pseudotumors (15 out of 34) with 85% sensitivity, 68% specificity, 10% positive predictive value, 99% negative predictive value.

CONCLUSION: 2D Echocardiography is an excellent, non invasive technique for first line evaluation of patients with suspicion CM. It is safe, reliable with a high predictive value and diagnostic accuracy in identifying CM and their benign or malignant nature. In contrast, these results were insufficient to start an anticoagulant in suspicion thrombus or cardiac surgery for primary tumor, since second level instrumental examinations needed. 2D Echocardiography alone seems unuseful for classifying malignant masses in primitive or metastasis.