

Suggested modifications of the recommendations for echocardiography in patients with clinical suspicion of infective endocarditis

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Introduction

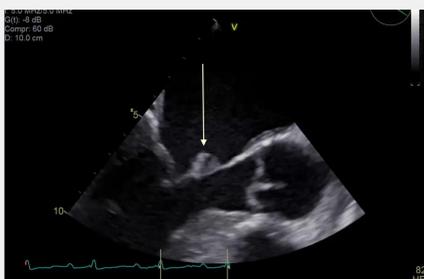
Infective endocarditis (IE) is a serious condition that requires prompt diagnosis and treatment. Transoesophageal echocardiography (TOE) has higher sensitivity for IE than transthoracic (TTE), yet TOE has a higher risk of complications. This project aimed to evaluate the European Society of Cardiology (ESC) recommendations for the diagnostics of IE to examine whether they result in an unnecessarily large number of negative TOE examinations.

Table 1. Distribution of the modified Duke criteria among the TOE examinations.

Major criteria	TOE (n (%))	TOE with positive result (n (%))
Positive blood culture, n (%)	137 (70)	49 (36)
Negative blood culture, n (%)	22 (11)	4 (18)
Unknown result from blood culture, n (%)	34 (17)	7 (21)
Positive TOE, n (%)	61 (31)	
¹⁸ F PET/CT, n (%)	24 (12)	10 (42)
Minor criteria		
Predisposing factors		
- CIED	10 (5)	7 (70)
- Prosthetic valve (-s)	44 (23)	17 (39)
Fever (>38 C)	119 (61)	44 (37)
Vascular phenomena, n (%)	21 (11)	7 (33)
Immunological phenomena, n (%)	0 (0)	0 (0)

Material and method

All TOE examinations performed due to clinical suspicion of IE between 2019-05-01 and 2020-04-30 at Karolinska University Hospital in Stockholm were analyzed in relation to the ESC recommendations.



The arrow shows a vegetation on the mitral valve

Table 2. Adherence to the ESC recommendations for TOE.

Recommendation for TOE	TOE exams (n (%))	Exams with positive result (n (% of the referrals with indication for TOE))
Prosthetic valve IE, CIED, CVC associated infection	51 (26)	23 (45)
Suspicion of- or confirmed fungal IE	5 (3)	2 (40)
Gram positive (incl. S. aureus) bacteraemia and clinical suspicion of IE	115 (59)	42 (37)
Suspicion of abscess	2 (1)	2 (100)
Slow therapeutic response and persistent positive blood culture after 72-96 hours	18 (9)	9 (50)
Complicated IE	10 (5)	10 (100)
Positive TTE	12 (6)	12 (100)
Inconclusive TTE and clinical suspicion of IE	19 (10)	6 (32)
Negative TTE and clinical suspicion of IE	36 (18)	5 (14)
Total	159 (82)	57 (36)

Results

In total 195 TOE examinations (Table 1) from 160 patients were included, of which 61 (31%) were positive for IE. 159 (82%) of the examinations followed at least one recommendation for TOE (Table 2). In patients with negative TTE, 86% had negative TOE. Of the 5 (14%) negative TTE that had positive TOE, all had CIED or prosthetic valves.

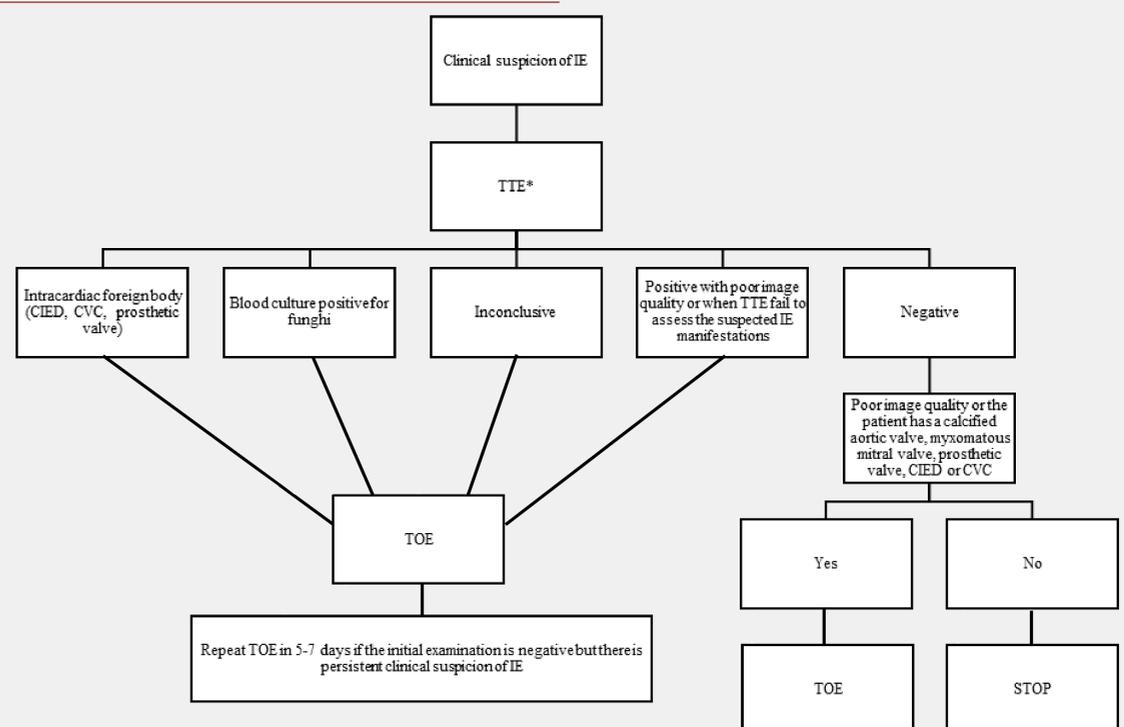


Fig 1. Modified flow chart of indications for TOE in patients with suspected IE.

Conclusions

The ESC recommendations for TOE in patients with clinical suspicion of IE are probably broad enough not to miss patients with IE, but there might be an unnecessarily large number of patients that get referred for TOE with negative results. To avoid this, we propose a modification of the recommendations for TOE in patients with clinical suspicion of IE. Negative TTE examination with good image quality and no indications for TOE such as prosthetic valves, CIED etc., according to Fig 1, could result in avoiding unnecessary TOE examinations without jeopardizing the IE diagnosis.

Abbreviations: CIED, cardiovascular implantable electronic device; CT, computed tomography; FDG, fluorodeoxyglucose; PET, positron emission tomography.