

References

1. Manning WJ, Weintraub RM, Waksmonski CA, Haering JM, Rooney PS, Maslow AD, Johnson RG, Douglas PS. Accuracy of transesophageal echocardiography for identifying left atrial thrombi. A prospective, intraoperative study. *Ann Intern Med* 1995;123:817–822.
2. Al-Saady NM, Obel OA, Camm AJ. Left atrial appendage: structure, function, and role in thromboembolism. *Heart* 1999;82:547–554.
3. Roldán FJ, Vargas-Barrón J, Mendoza LL, Romero-Cárdenas A, Espinola-Zavaleta N, Barragán R, Patrick M. Anatomic correlation of left atrial appendage by 3-dimensional echocardiography. *J Am Soc Echocardiogr* 2001;14:941–944.
4. Mügge A, Kühn H, Nikutta P, Grote J, Lopez JA, Daniel WG. Assessment of left atrial appendage function by biplane transesophageal echocardiography in patients with nonrheumatic atrial fibrillation: identification of a subgroup of patients at increased embolic risk. *J Am Coll Cardiol* 1994;23:599–607.
5. Uretsky S, Shah A, Bangalore S, Rosenberg L, Sarji R, Cantales DR, Macmillan-Marotti D, Chaudhry FA, Sherrid MV. Assessment of left atrial appendage function with transthoracic tissue Doppler echocardiography. *Eur J Echocardiogr* 2009;10:363–371.
6. Chen Ou-di, WU Wei-chun, Jiang Yong, Xiao Ming-hu and Wang Hao. Assessment of the morphology and mechanical function of the left atrial appendage by real-time three-dimensional transesophageal echocardiography. *Chin Med J (Engl)* 2012;125:3416–3420.
7. Bashir M, Asher CR, Garcia MJ, Abdalla I, Jasper SE, Murray RD, Grimm RA, Thomas JD, Klein AL. Right atrial spontaneous echo contrast and thrombi in atrial fibrillation: a transesophageal echocardiography study. *J Am Soc Echocardiogr* 2001;14:122–127.
8. Black I. Spontaneous echo contrast: where there's smoke there's fire. *Echocardiogr* 2000;17:373–382.
9. Blum A, Reisner S, Farbstein Y. Transesophageal echocardiography (TEE) vs. transthoracic echocardiography (TTE) in assessing cardio-vascular sources of emboli in patients with acute ischemic stroke. *Med Sci Monit* 2004;10:521–523.
10. Pálincás A, Antonielli E, Picano E, Pizzuti A, Varga A, Nyúzó B, Alegret JM, Bonzano A, Tanga M, Coppolino A, Forster T, Baralis G, Delnevo F, Csanády M. Clinical Value of Left Atrial Appendage Flow for Prediction of Long-Term Sinus Rhythm Maintenance in Patients With Nonvalvular Atrial Fibrillation. *J Am Coll Cardiol* 2002;39:1443–1449.
11. Carerj S, Paolatrifiro M, Granata A, Luzzza F, Arrigo F, Oreto G. Comparison between Transesophageal Echocardiography and Transthoracic Echocardiography with Harmonic Tissue Imaging for Left Atrial Appendage Assessment. *Clin Cardiol* 2002;25:268–270.
12. Parvathaneni L, Mahenthiran J, Jacob S. Comparison of tissue Doppler dynamics to Doppler flow in evaluating left atrial appendage function by transesophageal echocardiography. *Am J Cardiol* 2005;95:1011–1014.
13. Sallach J, Puwanant S, Drinko J. Comprehensive left atrial appendage optimization of thrombus using surface echocardiography: the CLOTS multicenter pilot trial. *J Am Soc Echocardiogr* 2009;22:1165–1172.

14. Donal E, Sallach J, Murray R. Contrast-enhanced tissue Doppler imaging of the left atrial appendage is a new quantitative measure of spontaneous echocardiographic contrast in atrial fibrillation. *Eur J Echocardiogr* 2008;9:5–11.
15. Agmon Y, Khandheria B, Gentile F. Echocardiographic Assessment of the Left Atrial Appendage. *J Am Coll Cardiol* 1999;34:1867–1877.
16. Ayirala S, Kumar S, O'Sullivan D, Silverman D. Echocardiographic predictors of left atrial appendage thrombus formation. *J Am Soc Echocardiogr*. 2011;24:499–505.
17. Jaber W, Prior D, Thamilarasan M. Efficacy of anticoagulation in resolving left atrial and left atrial appendage thrombi: a transesophageal echocardiography study. *Am Heart J* 2000;140:150–156.
18. Sahin T, Ural D, Kilic T. Evaluation of left atrial appendage functions according to different etiologies of atrial fibrillation with a tissue Doppler imaging technique by using transesophageal echocardiography. *Echocardiogr* 2009;26:171–181.
19. Doukky R, Khandelwal A, Garcia-Sayan E, Gage H. External validation of a novel transthoracic echocardiographic tool in predicting left atrial appendage thrombus formation in patients with nonvalvular atrial fibrillation. *Eur Heart J Cardiovasc Imaging* 2013. – <http://ehjcm.oxfordjournals.org/content/early/2013/01/04/ehjci.jes313.full.pdf+html?sid=fe6896d3-d344-47d6-a25b-2598d0daf0b8>.
20. Fatkin D, Feneley M. Patterns of Doppler-measured blood flow velocity in the normal and fibrillating human left atrial appendage. *Am Heart J* 1996;132:995–1003.
21. Fatkin D, Kelly R, Feneley M. Relations between left atrial appendage blood flow velocity, spontaneous echocardiographic contrast and thromboembolic risk in vivo. *J Am Coll Cardiol* 1994;23:961–969.
22. Geneviève Côté, André Denault “Transesophageal echocardiography-related complications”. *Can J Anesth* 2008;55:622–647.
23. Camm J, Kirchhof P, Lip G. Guidelines for the management of atrial fibrillation. *Eur Heart J* 2010;31:2369–2429.
24. Gultekin K, Inamdar V, Navin CN. Comparative Assessment of Left Atrial Appendage by Transesophageal and Combined Two- and Three-Dimensional Transthoracic Echocardiography. *Echocardiogr* 2008;25:918–924.
25. Hart R, Halperin J. Atrial fibrillation and stroke: concepts and controversies. *Stroke* 2001;32:803–808.
26. Omran H, Jung W, Rabahieh R. Imaging of thrombi and assessment of left atrial appendage function: a prospective study comparing transthoracic and transoesophageal echocardiography. *Heart* 1999;81:192–198.
27. Manning W, Silverman D, Katz S. Impaired left atrial mechanical function after cardioversion: relation to the duration of atrial fibrillation. *J Am Coll Cardiol* 1994;23:1535–1540.

28. Ono M, Asanuma T, Tanabe K. Improved visualization of the left atrial appendage by transthoracic 2-dimensional tissue harmonic compared with fundamental echocardiographic Imaging. *J Am Soc Echocardiogr*. 1998;11:1044–1049.
29. Tabata T, Oki T, Fukuda N. Influence of left atrial pressure on left atrial appendage flow velocity patterns in patients in sinus rhythm. *J Am Soc Echocardiogr* 1996;9:857–864.
30. Kerut EK. Anatomy of the Left Atrial Appendage. *Echocardiogr* 2008;25:669–673.
31. Bollmann A, Biniyas K-H, Grothues F. Left Atrial Appendage Function and Pulmonary Venous Flow in Patients with Nonrheumatic Atrial Fibrillation and Their Relation to Spontaneous Echo Contrast. *Echocardiogr* 2002;19:37–43.
32. Rosca M, Lancellotti P, Popescu B, Piérard L. Left atrial function: pathophysiology, echocardiographic assessment, and clinical applications. *Heart* 2011;97:1982–1989.
33. Stoddard M, Singh P, Dawn B, Longaker R. Left atrial thrombus predicts transient ischemic attack in patients with atrial fibrillation. *Am Heart J* 2003;145:676–682.
34. Chapeau C, Gutkowska J, Schiller P. Localization of immunoreactive synthetic atrial natriuretic factor (ANF) in the heart of various animal species. *J Histochem Cytochem* 1985;33:541–550.
35. Tamura H, Watanabe T, Hirono O. Low wall velocity of left atrial appendage measured by trans-thoracic echocardiography predicts thrombus formation caused by atrial appendage dysfunction. *J Am Soc Echocardiogr* 2010;23:545–552.
36. De Luca I, Colonna P, Sorino M. New Monodimensional Transthoracic Echocardiographic Sign of Left Atrial Appendage Function. *J Am Soc Echocardiogr* 2007;20:324–332.
37. Pollick C, Taylor D. Assessment of left atrial appendage function by transesophageal echocardiography. Implications for the development of thrombus. *Circulation* 1991;84:223–231.
38. Predictors of thromboembolism in atrial fibrillation: II. Echocardiographic features of patients at risk / The Stroke Prevention in Atrial Fibrillation Investigators. *Ann Intern Med* 1992;116:6–12.
39. Ogren M, Bergqvist D, Eriksson H, Lindblad B. Prevalence and risk of pulmonary embolism in patients with intracardiac thrombosis: a population-based study of 23796 consecutive autopsies. *Eur Heart J* 2005;26:1108–1114.
40. Leung D, Black I, Cranney G. Prognostic implications of left atrial spontaneous echo contrast in nonvalvular atrial fibrillation. *J Am Coll Cardiol* 1994;24:755–762.
41. Piszko P, Lewczuk J, Lenartowska L. Pulmonary thromboembolism in 102 consecutive patients with chronic atrial fibrillation. Diagnostic value of echocardiography. *Kardiol Pol* 2007;65:246–251.
42. Ling L, Hirono O, Okuyama H. Ratio of peak early to late diastolic filling velocity of the left ventricular inflow is associated with left atrial appendage thrombus formation in elderly patients with acute ischemic stroke and sinus rhythm. *J Cardiol* 2006;48:75–84.

43. Pepi M, Evangelista A, Nihoyannopoulos P. Recommendations for echocardiography use in the diagnosis and management of cardiac sources of embolism: European Association of Echocardiography (EAE) (a registered branch of the ESC). *Eur J Echocardiogr* 2010;11:461–476.
44. Flachskampf FA, Badano L, Daniel WG, Feneck RO, Fox KF, Fraser AG, Pasquet A, Pepi M, Perez de Isla L, Zamorano JL; European Association of Echocardiography; Echo Committee of the European Association of Cardiothoracic Anaesthesiologists, Roelandt JR, Piérard L. Recommendations for transoesophageal echocardiography: update 2010. *Eur J Echocardiogr* 2010;11:557–576.
45. Cianciulli TF, Saccheri MC, Lax JA, Bermann AM, Méndez RJ, Guerra JE, Redruello HJ, Dorelle AN. Right and left atrial appendage function in patients with mitral stenosis and sinus rhythm. *Int J Cardiovasc Imaging* 2009;25:363–370.
46. Ozer O, Sari I, Davutoglu V. Right Atrial Appendage: Forgotten Part of the Heart in Atrial Fibrillation. *Clin Appl Thromb Hemost* 2010;16:218–220.
47. Sahin T, Ural D, Kilic T. Right atrial appendage function in different etiologies of permanent atrial fibrillation: a transesophageal echocardiography and tissue Doppler imaging study. *Echocardiogr* 2010;27:384–393.
48. Bilge M, Eryonucu B, Güler N, Erkoç R. Right atrial appendage function in patients with chronic nonvalvular atrial fibrillation. *Jpn Heart J* 2000;41:451–462.
49. de Divitiis M, Omran H, Rabahieh R, Rang B. Right atrial appendage thrombosis in atrial fibrillation: its frequency and its clinical predictors. *Am J Cardiol* 1999;84:1023–1028.
50. Donal E, Yamada H, Leclercq C, Herpin D. The Left Atrial Appendage, a Small, Blind-Ended Structure. A Review of Its Echocardiographic Evaluation and Its Clinical Role. *CHEST* 2005;128:1853–1862.
51. Gurlertop Y, Yilmaz M, Acikel M, Bozkurt E, Erol MK, Gundogdu F, Senocak H, Atesal S. The Use of Anatomic M-Mode Echocardiography to Determine the Left Atrial Appendage Functions in Patients with Sinus Rhythm. *Echocardiogr* 2005;22:99–103.
52. Thomas L. Assessment of atrial function. *Heart, Lung and Circulation* 2007;16:234–242.
53. Leung D, Davidson P, Granney G, Walsh W. Thromboembolic risks of left atrial thrombus detected by transesophageal echocardiogram. *Am J Cardiol* 1997;79:626–629.
54. Alessandri N, Mariani S, Ciccaglioni A, Messina FR, Gaudio C, Rondoni G, Parlapiano C. Thrombus formation in the left atrial appendage in the course of atrial fibrillation. *Eur Rev Med Pharmacol Scie* 2003;7:65–73.
55. Subramaniam B, Riley M, Panzica P, Manning W. Transesophageal echocardiographic assessment of right atrial appendage anatomy and function: comparison with the left atrial appendage and implications for local thrombus formation. *J Am Soc Echocardiogr* 2006;19:429–433.
56. Transesophageal echocardiographic correlates of thromboembolism in high-risk patients with nonvalvular atrial fibrillation / The Stroke Prevention in Atrial Fibrillation Investigators Committee on Echocardiography. *Ann Intern Med* 1998;128:639–647.

57. Shen X, Li H, Rovang K, Hee T, Holmberg MJ, Mooss AN, Mohiuddin SM. Transesophageal echocardiography before cardioversion of recurrent atrial fibrillation: does absence of previous atrial thrombi preclude the need of a repeat test? *Am Heart J* 2003;146:741–745.
58. Aschenberg W, Schlüter M, Kremer P, Schröder E, Siglow V, Bleifeld W. Transesophageal two-dimensional echocardiography for the detection of left atrial appendage thrombus. *J Am Coll Cardiol* 1986;7:163–166.
59. Fukuda N, Shinohara H, Sakabe K, Onose Y, Nada T, Tamura Y. Transthoracic Doppler echocardiographic measurement of left atrial appendage blood flow velocity: comparison with transoesophageal measurement. *Eur J Echocardiogr* 2003;4:191–195.
60. Yoshida N, Okamoto M, Nanba K, Yoshizumi M. Transthoracic Tissue Doppler Assessment of Left Atrial Appendage Contraction and Relaxation: Their Changes with Aging. *Echocardiogr* 2010;27:839–846.
61. Tsai L, Chao T, Chen J. Association of follow-up change of left atrial appendage blood flow velocity with spontaneous echo contrast in nonrheumatic atrial fibrillation. *Chest* 2000;117:309–313.
62. Watson T, Shantsila E, Lip G. Mechanisms of thrombogenesis in atrial fibrillation: Virchow's triad revisited. *Lancet* 2009;373:155–166.