The left atrial and appendage function following successful electric cardioversion in atrial fibrillation.

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Introduction: External direct current cardioversion remains the most widely used and cost-effective method to restore sinus rhythm (SR). Echocardiography is a unique and important tool in the assessment of cardiac structure and function. Newer myocardial imaging tools like tissue Doppler and strain rate imaging provides further insight to atrial contractile function.

Methods: It's a prospective observational study. The Echocardiographic assessment of LA by TTE and TEE was done pre and post direct current cardioversion at 0, 1, 3- and 6-months. Echocardiographic parameters assessed on TTE were LVEF, LAEF, A wave velocity, A’ velocity, LArV, LA peak systolic strain, and LAFI. TEE was done to assess LAAeV.

Result: The LVEF improvement from a baseline, 48.55% to 50.08% immediately post successful ECV to 52.00%, 53.57% at 1 and 3 month respectively and 55.45% at 6 months (p =0.000). LAEF improved to 30.64% immediately post ECV from baseline 29.85%, to 33.31%, 35.61% at 1 and 3 month to 39.05% at 6 months (p =0.000). The mitral A(cm/s) velocity increased from 36.16 (cm/s) to 53.55 cm/s at 1 month and at 3 and 6 months to 56.55 and 58.28 respectively (p =0.000). The LArV increased from 18.98 cm/s immediately post cardioversion to 24.95 cm/s at 1 month and 26.99 cm/s, 27.91 cm/s at 3 and 6 months respectively (p =0.000). The mitral annular A’ velocity, improved following successful electrical cardioversion and improved thereafter at 1 month to 6.04 cm/s and 7.44 cm/s, 8.19 cm/s at 3 and 6 months respectively (p =0.000). The LAAeV declined initially from a baseline 32.69 cm/s to 22.79 cm/s, but later improved at 1 months to 38.21 cm/s, and to 45.63 and 51.41 cm/s at 3 and 6 months respectively (p =0.000). The Left atrial peak systolic strain improved marginally from 11.00% during atrial fibrillation to 11.99% post ECV, and to 19.50% at first month and a significant increase at 3 months to 30.91% and at 6 months to 38.40% (p =0.000). Pre ECV LAFI-did improved immediately following successful cardioversion from 0.10 to 0.14 immediately post cardioversion. The LAFI continued to improve at 1 month and 3 months post successful ECV to 0.23 and 0.25 respectively and beyond at 6-months to 0.26 (p =0.000).

Conclusion: The Systolic function of the left atrium (left atrial emptying fraction) improved after successful cardioversion. The LA function (A velocity, Atrial filling fraction and LArV) improved following successful cardioversion. Tissue Doppler increase after successful electrical cardioversion. LAEeV decreases immediately the following cardioversion and later recovered on the maintenance of sinus rhythm. LA peak systolic strain progressively improves after the first month. LAFI showed a significant increase after successful cardioversion.