

## Contraction of blood clots is impaired in acute ischemic stroke

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### Abstract

© 2016 American Heart Association, Inc. Objective - Obstructive thrombi or thrombotic emboli are the pathogenic basis of ischemic stroke. In vitro blood clots and in vivo thrombi can undergo platelet-driven contraction (retraction), resulting in volume shrinkage. Clot contraction can potentially reduce vessel occlusion and improve blood flow past emboli or thrombi. The aim of this work was to examine a potential pathogenic role of clot contraction in ischemic stroke. Approach and Results - We used a novel automated method that enabled us to quantify time of initiation and extent and rate of clot contraction in vitro. The main finding is that clot contraction from the blood of stroke patients was reduced compared with healthy subjects. Reduced clot contraction correlated with a lower platelet count and their dysfunction, higher levels of fibrinogen and hematocrit, leukocytosis, and other changes in blood composition that may affect platelet function and properties of blood clots. Platelets from stroke patients were spontaneously activated and displayed reduced responsiveness to additional stimulation. Clinical correlations with respect to severity and stroke pathogenesis suggest that the impaired clot contraction has the potential to be a pathogenic factor in ischemic stroke. Conclusions - The changeable ability of clots and thrombi to shrink in volume may be a novel unappreciated mechanism that aggravates or alleviates the course and outcomes of ischemic stroke. The clinical importance of clot or thrombus transformations in vivo and the diagnostic and prognostic value of this blood test for clot contraction need further exploration.

<http://dx.doi.org/10.1161/ATVBAHA.116.308622>

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### Keywords

blood coagulation, clot retraction, stroke, thrombosis

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