

Abdominal Contouring Procedures Are Associated with a Physiologic Hypercoagulable State

Amy S. Colwell, M.D., Richard G. Reish, M.D., David J. Kuter, M.D., D.Phil., Branimir Damjanovic, M.D., William G. Austen Jr., M.D., Annemarie E. Fogerty, M.D.

Background: One of the most serious complications from plastic surgery is a thromboembolic event. The incidence of thromboembolism in truncal contouring procedures ranges from 1-9%.¹ However, little physiologic evidence exists to support the observed hypercoagulable state. This is the first study to assess physiological markers of hypercoagulability, and one of few prospective studies addressing thromboembolic risk and prophylaxis in body contouring patients.

Methods: Twenty-one consecutive patients undergoing truncal contouring procedures were enrolled prospectively to assess thrombin generation intraop and postop. Thrombin generation is a sensitive tool for detecting increased activity of the coagulation cascade.²⁻⁵ Each patient's intraop and postop values were normalized to baseline thrombin generation.

Results: Nine patients with an average age of 44 (range 24-64) and a mean BMI of 25 (21-31) underwent abdominoplasty without DVT chemoprophylaxis. Total thrombin generation increased a mean of 972 intraoperatively (1.3 fold increase, $p<0.004$), and postoperative thrombin generation increased a mean of 1406 (1.4 fold increase, $p<0.001$) (Figure 1). Twelve patients with an average age 46 (range 35-60) and a mean BMI of 30.8 (22.2-39.9) underwent abdominoplasty with DVT chemoprophylaxis due to the higher risk profile. In this group receiving heparin chemoprophylaxis, the mean thrombin generation increase was not significant ($p=0.3$). The intraoperative and postoperative thrombin generation were significantly less in patients receiving heparin chemoprophylaxis compared to those who received no prophylaxis ($p<0.02$ for each). There were no thromboembolic events or bleeding complications.

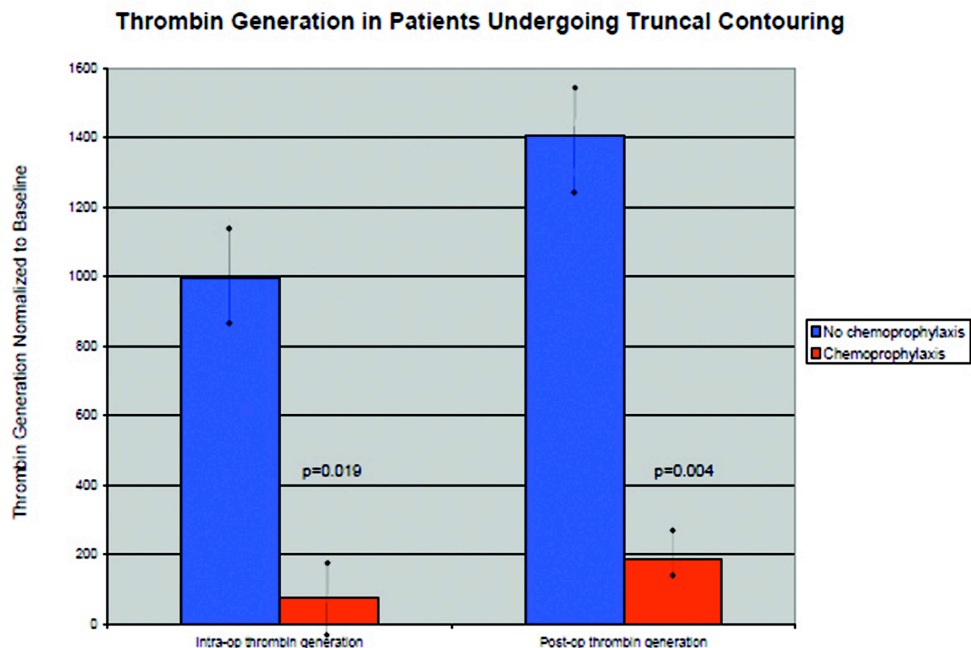


Figure 1: Thrombin generation increases from baseline in patients undergoing truncal contouring without heparin chemoprophylaxis.

Conclusion: Activity of the coagulation cascade increases in patients undergoing abdominal contouring procedures. The magnitude of change may be decreased by giving perioperative

heparin chemoprophylaxis. Further studies are warranted to determine the clinical relationship between thrombin generation, chemoprophylaxis, and the risks of thromboembolism and bleeding.

References:

1. Aly AS, Cram AE, Chao M, et al. Belt lipectomy for circumferential truncal excess: The University of Iowa experience. *Plast. Reconstr. Surg.* 2003;111:398.
2. Brummel-Ziedins KE, Vossen CY, Butenas S, et al. Thrombin generation profiles in deep venous thrombosis. *J Thromb Haemost.* 2005;3(11):2497-2505.
3. Segers O, van Oerle R, ten Cate H, et al. Thrombin generation as an intermediate phenotype for venous thrombosis. *Thromb Haemost* 2010;103(1):114-22.
4. Hron G, Kollars M, Binder BR, et al. Identification of Patients at Low Risk for Recurrent Venous Thromboembolism by Measuring Thrombin Generation. *JAMA* 2006; 296:397-402.
5. Eichinger S, Hron G, Kollars M, et al. Prediction of Recurrent Venous Thromboembolism by Endogenous Thrombin Potential and D-Dimer. *Clinical Chemistry.* 2008;54:12 2042-2048.

Disclosures: None of the authors have any financial disclosures related to the study.