

Can Air-Inflated Compression Provide Higher Inelastic Compression?



ALISHA OROPALLO, MD^{1,2}; GIOVANI MOSTI, MD³; NICO LABRAPOULOS, MD⁴; AND ANTONIOS GASPARIS, MD⁴

¹Northwell Health System, Department of Surgery, Comprehensive Wound Care Healing and Hyperbarics, Lake Success, NY 11042;

²Donald & Barbara Zucker School of Medicine at Hofstra/Northwell, Hempstead, NY 11550; ³Department of Angiology, Clinica Barbantini, Lucca, Italy;

⁴Center for Vein Care, Stony Brook University, Stony Brook, NY

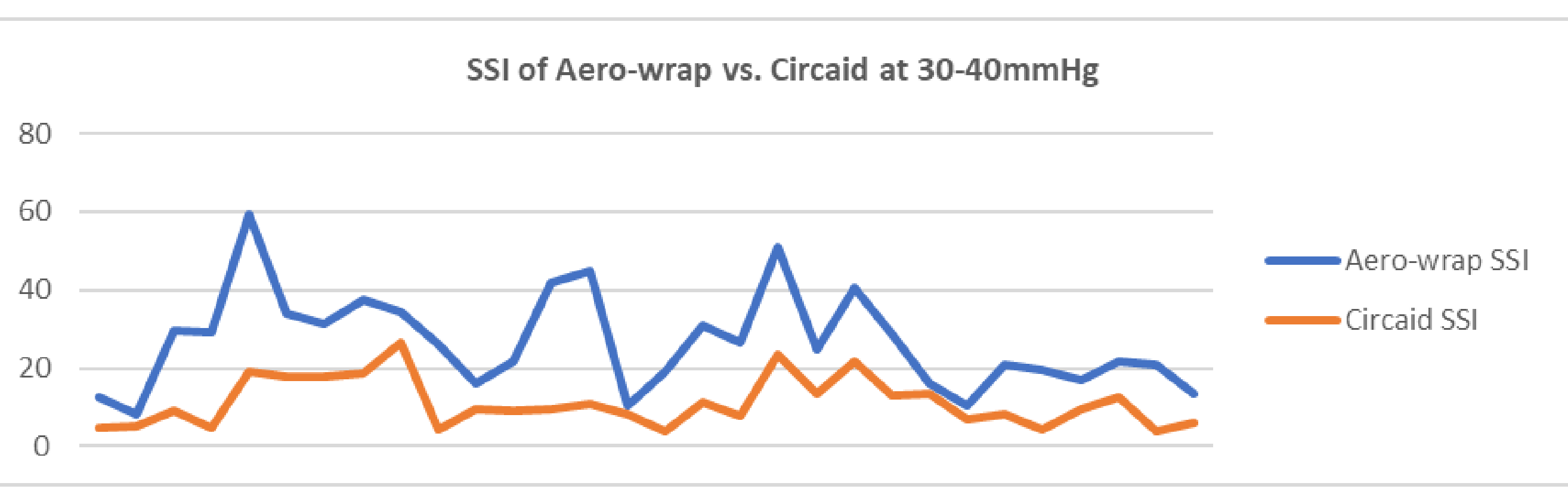
Introduction

In advanced stages of venous and lymphatic disease, compression with inelastic bandages or adjustable compression wraps (ACW) is preferred due to their significantly higher hemodynamic effectiveness. There are several ACW available which are classified as inelastic compression. The aim of this study is to compare the exerted pressure and the stiffness of a new compression device (ACWa) based on a Velcro® closure with a built-in air bladder (Aero-Wrap®, Sun Scientific, NY, USA) to the Juxtalite Circaid (ACWb).

Methods

The stiffness of a compression device can be measured by measuring the interface pressure between a compression device and the skin. Static Stiffness Index (SSI) is defined as the difference between the pressure exerted at the B point in the standing position versus the supine. The SSI was calculated using the PicoPress® device connected with Bluetooth to the PicoPress® computer software program. This is a prospective study of 30 limbs in 15 normal volunteers. The ACWa is placed on the limb after securing the PicoPress® probe at the B1 position. The wrap is inflated to 30-40mmHg using a hand pump which is attached on the sleeve. A baseline supine and standing pressures are obtained and the computer calculates the SSI. These measurements were repeated after securing the ACWb on the limb at 30-40mmHg using the provided BPS™ card.

Results



A total of 30 limbs in 15 subjects were enrolled. There were 13 women and 2 men, the average age was 32 years. Both devices consistently delivered the desired applied pressure (30-40mmHg) in the supine position. The average SSI was significantly higher with ACWa.

30-40mmHg Compression			
	Supine (mmHg)	Standing (mmHg)	SSI (mmHg)
Aero-Wrap®	36.9	63.6	26.7
Circaid®	38.4	49.6	11.2

Conclusion

The devices studied are able to deliver the desired interface pressure in the supine position and inelastic compression with SSI >10mmHg. The novel compression wrap, which uses an inflatable air bladder to deliver the desired compression pressure, provided significantly higher stiffness which may improve clinical outcomes. Further clinical studies in patients with veno-lymphatic disorders are needed to evaluate clinical superiority.