

Safety of using a novel device for creating a bloodless surgical field in pediatric limb fractures

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Introduction

The objective of the tourniquet is to provide a surgical field free of blood in order to reduce bleeding, easily identify anatomical structures and as a consequence reduce length of surgery. Additionally, exsanguination of the patient's limb reduces bleeding and improves the surgical field. In children the use of the tourniquet is as common as in adults but there are factors that preclude the use of the standard pneumatic tourniquet, including the length of the limb and the conic shape of the child's thigh that causes distal sliding of the tourniquet. The SET (Surgical Exsanguination Tourniquet) is a new device made of a silicon ring wrapped with a sterile stockinet sleeve. The SET is placed on the operated limb and then rolled proximally, while the elastic sleeve is spread and a bloodless sterile field is formed.

Aims

The aims of the present study are (a) to investigate the safety and efficiency of a method of imaging-guided axial limb traction during SET placement for internal fixation of pediatric limb fractures, and (b) to formulate instructions for use and identify contraindications for the use of the SET with axial stretching.

Materials and Methods

Following authorization of the Ethics Committee we recruited 39 children and teenagers (3 - 18 years) that were admitted to the Pediatric Orthopedic Unit at Rambam Medical Center for surgery including open/closed reconstruction and internal fixation of limb fractures. 26 of the patients were operated on with SET and 13 without (control).

Results and discussion

No SET placement-related or pneumatic tourniquet complications were observed. The axial traction by two surgeons technique was applied with no difficulty. The surgical procedures were under excellent visibility conditions with the SET. The SET was found to be safe for use in trauma while performing the axial stretching technique under imaging control.