Prevention of thromboembolic complications using intermittent pneumatic compression in major brain surgery

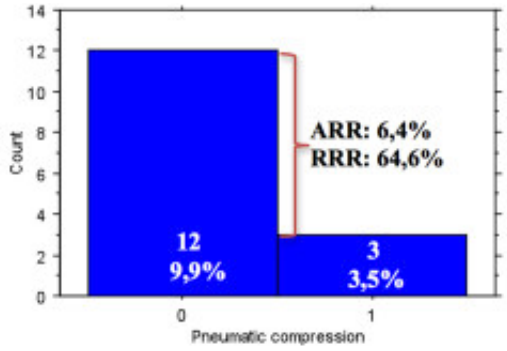

Fig. 1. Histogram, showing the occurrence of thrombotic events in 86 patients with and 121 without the use of intraoperative and postoperative pneumatic compression devices. ARR means absolute risk reduction. RRR means relative risk reduction.

Deep venous thrombosis is the most common adverse event after brain surgery ranging from 3 - 26%.
We introduced an electric device for the compression of the legs to reduce the risk of thrombosis in the leg during and after major brain surgery. We performed a study to evaluate the introduction this device added to the normal preventive measures as the use of compression stockings, low molecular weight heparin and early mobilization out of bed.
We analyzed 207 patients with major brain surgery. A group of 86 patients was treated with the additional use of a leg compression device until mobilization out of bed. 121 patients were treated with the normal preventive measures only. After surgery the patients were screened for thrombosis and pulmonary embolism.

The chance to develop thrombosis in the legs was reduced in our patients with the use of the compression device from 9,9% to 3,5 %. That is a 64,6% relative risk reduction to develop thrombosis with the use of leg compression (Fig. 1).

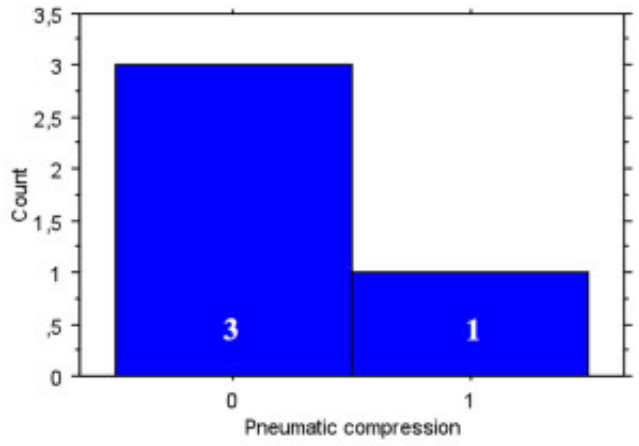

Fig. 2. Histogram, showing the distribution of intraoperative and postoperative pneumatic compression devices in 4 patients with proven pulmonary embolism. Only one patient with pulmonary embolism had pneumatic compression: His BMI was 36 and his OR-time 525 min.

For pulmonary embolism, we found a 52% relative risk reduction to develop pulmonary embolism with the compression device.
The results showed an increased risk of pulmonary embolism for male patients with a long time in surgery, a high Body mass index (BMI) and malignant glioma.

This study demonstrates a benefit of compression device with a risk reduction for the development of thrombotic complications. Surgical time is another risk factor that attributes to a significant risk for the development of thrombotic complications.

This study shows that the male overweight patient with malignant glioma and a long surgical time is at high risk for thrombotic events (Fig. 2). For patients of these groups should be watched more carefully for these complications.

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Publication

Prevention of venous thromboembolic complications with and without intermittent pneumatic compression in neurosurgical cranial procedures using intraoperative magnetic resonance imaging. A retrospective analysis.
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Clin Neurol Neurosurg. 2015 Jun