

P 22

PROTECTING VITAL ORGANS FROM BLEEDING AND RUPTURE DURING NEGATIVE PRESSURE WOUND THERAPY

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Aims: There are deaths and serious complications associated with the use of negative pressure wound therapy (NPWT). Bleeding occur in vascular grafts, in sternal and groin wounds. These tissues are however often exposed to negative pressure due to lack of other effective treatment. Heart rupture and death is the most devastating complication and may occur during the treatment of poststernotomy mediastinitis. We have developed an organ protector to avoid complications.

Methods: Sixteen pigs underwent median sternotomy followed by NPWT. An organ protector was constructed using a perforated plastic rigid material. This device was placed inside the thorax between the heart and the sternal edges. The interaction of the heart and lungs with the organ protector and the hemodynamic effects were examined.

Results: NPWT without the organ protector caused the heart to be sucked up the sharp edges of the sternum jutted into and deformed the anterior surface of the heart resulting in epicardial bleedings. The rigid barrier protected the heart and lungs, while four layers of paraffin gauze had no such effect. Heart and lung function was preserved when using the organ protector.

Conclusion: There are hazardous events associated with NPWT in sternotomy wounds, namely risk for heart and lung injury. Inserting a rigid barrier protects the heart and lungs. Organ protection may also be applicable in other wound types with underlying vital organs such as abdominal wounds and wounds with exposed vascular grafts and nerves.