Negative Pressure Wound Therapy using gauze or polyurethane open cell foam: similar early effects on pressure transduction and tissue contraction.

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Negative-pressure wound therapy (NPWT), also known as topical negative-pressure therapy, is widely used to manage wounds and accelerate healing. NPWT has so far been delivered mainly via open-cell polyurethane foam, but increasing interest has been directed toward delivering NPWT via gauze. In the present study, the early effects of NPWT on pressure transduction and wound contraction were examined in wounds filled with either polyurethane foam or gauze. An experimental setup of a porcine wound model was used, in which the animals were anesthetized for 12-14 hours. Negative pressures between -50 and -175 mmHg were applied in -25 mmHg increments. Wound bed pressure was measured using a saline filled catheter sutured to the bottom of the wound. The contraction of the wound edges was also determined. The recordings were performed upon reaching steady state, which typically occurred within 1 minute. For both fillers, wound bed negative pressure increased linearly with delivered vacuum with little deviation from set pressure (correlation coefficient 0.99 in both cases). Similar tissue contraction was observed when using foam and gauze. The most prominent contraction was observed in the range of 0 to -50 mmHg with greater vacuum only producing minor further movement of the wound edge. In conclusion, the present experimental study shows that gauze and foam are equally effective at delivering negative pressure and creating mechanical deformation of the wound.

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