Escharotomy of the trunk following full-thickness burn injury; an evidenced-based study

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BACKGROUND: Escharotomy is an integral part of the emergency management of a severe burn injury to release constriction resulting from the burn eschar. It is crucial it is carried out without causing damage to any major underlying structure. In the limbs the traditional sites in the mid axial lines are well established clinically and are discussed in all major burn texts. An advantage of mid axial incisions is that they may be also be utilized to gain access to all major underlying fascial compartments in the limbs. However there is little in the standard texts on escharotomy of the trunk, with suggested lines of escharotomy incisions commonly being illustrated by stick figures.

Methods: Assessment of normal respiratory movement looking at the relative roles of the chest and abdomen during normal respiration and their synchronicity and interdependence were studied and recorded utilizing respiratory inductance plethysmography

Respiratory movements of the chest and abdomen of healthy male athletes were recorded in standing and supine positions during normal and maximal respiration with high-speed infrared cameras and sensing. Information obtained from these sensorts provided antero-posterior, lateral and cranio-caudal views of the chest and abdominal movements during normal tidal breathing, and on maximal inspiration. The surface distance changes between these sensors indicated both the regions and the extent to which skin stretching occurred during inspiration in lateral, antero-posterior and cranio-caudal directions.

Results:

Respiratory inductive plethysmograph recording shows the synchronous movements of the chest and abdomen that occur during normal respiration.

In the erect subject: During inspiration the chest circumference increased and the chest wall moved anteriorly and laterally whilst the region of the spine remained static. These movements are consistent with the clinical description known as the 'pump handle' and 'bucket handle' effects, and are in keeping with the published respiratory literature. The circumferential expansion of the chest was greatest between the nipple and the lower end of the sternum. Skin stretching occurred anteriorly over the sternum and laterally in the axilla, but was absent in the region of the spine. There was no perceptible movement of the abdomen.

In the supine subject; measurement of the lateral expansion between sensors during inspiration was also greater in the axilla than over the sternum and was maximal over the lower ribs. This finding is consistent with the 'bucket handle' expansion of the chest wall which occurs during inspiration. In contrast to the erect subject, the abdominal wall moved anteriorly with inspiration, illustrating and confirming the resting abdominal tone seen in the erect posture.

Stretching of the anterior abdominal wall during inspiration occurred both circumferentially and cranio-caudally and was maximal in the epigastric and umbilical regions on the lateral aspect. The stretching of the skin in a cranio-caudal direction of the entire trunk was significantly greater in the midline than in the axillary region.