

LETTER TO EDITOR

Conventional axillary rolls in prolonged neurosurgical procedures: Time for reconsideration

Sir,

Neurosurgical procedures involving temporal lobe, skull base, posterior fossa, and the retroperitoneal approach to the thoracolumbar spine are often performed in the lateral position. Lateral position can lead to upper extremity neuropathies, arm ischemia, and compartment syndrome^[1,2] and thus axillary rolls are employed to support the upper chest and prevent positional injuries. Institutional variations exist in the manner these rolls are made. Often saline bottles or soft cotton rolls are wrapped with firm cotton towels to create axillary rolls. Using such axillary rolls may be inconsequential in short duration surgeries. However, in our experience, in prolonged surgeries their employment demands caution.

Three adult male patients underwent surgery in the lateral position for cerebello pontine angle tumor under general anesthesia with cotton towel axillary rolls placed in the dependent part of the chest wall inferior to the axilla. The details of the patient, their diagnosis, their duration of surgeries and the corresponding postoperative morbidities which they had developed postoperatively are enumerated in Table 1. First patient developed erythema and blisters on the site of the axillary roll placement [Figure 1]. The second patient developed pressure sores [Figure 2]. In the third patient, postoperative skin ulceration was noted [Figure 3]. The patients were managed conservatively for their injuries with regular antiseptic dressings and the wounds gradually healed.

Cotton towel axillary rolls may be disadvantageous in patients undergoing prolonged surgeries. These rolls have

Table 1: The details of patients and the types of injuries sustained

| Patient | Diagnosis | Duration of surgery | Morbidity |
|----------------|-----------------------------|---------------------|-----------------------|
| 34 years, male | Left vestibular schwannoma | 6 h | Erythema and blisters |
| 38 years, male | Left acoustic neuroma | 10 h | Pressure sores |
| 48 years, male | Right vestibular schwannoma | >12 h | Skin ulcerations |

a nonuniform surface which is abrasive and contributes to inflammation and blister formation due to skin friction. Over a period of time, owing to the uneven surface, irregular



Figure 1: Erythema and blister formation in the first patient



Figure 2: Pressure sores in the second patient



Figure 3: Skin ulceration in the third patient

spreading of the weight of the overlying tissues occurs resulting in higher pressure (perpendicular force per unit area) and tangential shear forces^[3] which impedes the regional microcirculation of the skin. Further, increase in the duration of ischemia and decreased perfusion leads to necrosis and ulceration of the skin. These complications may be accelerated due to perspiration (reducing strength of stratum corneum)^[4] and increased temperature (1° rise in temperature increases metabolic rate by 10% translating as a higher need of nutrients and greater waste generation)^[5] or in patients with medical conditions like atherosclerosis or diabetes. The severity of these injuries has a proportional relationship with elapsed time in which the patient is positioned over the rolls as is evident from our set of patients. Such injuries to the skin increase the patients' morbidity, cost of treatment and have medicolegal implications. As compared to axillary rolls made of cotton towels, those designed with reactive support surfaces such as inflatable cushions (water or air) and gel pads have a smoother uniform surface preventing skin abrasion. They allow immersion and envelopment of the support surface and even distribution of the body's weight over increased contact area thereby reducing the interface pressure and shear forces.^[3] Positioning the arm over the edge of the bed and avoiding a roll altogether is another method to prevent these injuries.

The comparative safety of inflatable cushions and gel pads over cotton towel rolls can only be proven by large scale trials. However, we consider that in prolonged surgical procedures in the lateral position, it would be prudent to avoid cotton towel axillary rolls and use gel pads or inflatable cushions instead.

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