

An Innovative Technique for Surgical Positioning in Head and Neck Surgery

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ABSTRAK

Kedudukan pesakit di atas meja pembedahan adalah penting dalam memastikan keselesaan pesakit, maruah pesakit dan akses yang baik kepada pakar bedah. Kedudukan yang tepat membantu dalam mengurangkan risiko kecederaan kepada pesakit. Beg udara rekaan sendiri boleh dibuat dengan bekalan perubatan dikitar semula di dewan pembedahan. Peralatan rekaan ini boleh menggantikan beg pasir konvensional untuk pembedahan kepala dan leher. Ia melibatkan penggunaan botol pengairan yang kosong, injap dan tiub sedutan. Bentuk beg udara boleh dilaraskan dengan mudah dengan mengubah isipadu udara di dalam beg. Penggunaan beg yang berisi udara membolehkan beg mengubah bentuk dan mengacukan permukaannya berdasarkan kelengkungan permukaan luar pesakit. Ini mengurangkan risiko tekanan pada kulit teruamnya dalam pembedahan yang berpanjangan. Kesimpulannya, kaedah ini adalah suatu teknik bijak, inovatif dan menjimatkan perbelanjaan kewangan dengan menggunakan bahan kitar semula.

Kata kunci: Inovasi, beg pasir, kedudukan, beg udara

ABSTRACT

Patient positioning is a vital in ensuring patient comfort, dignity and good access to the operative site. Accurate positioning helps in minimising the risk of injury to the patient. An in-house airbag made from recyclable medical supplies can be used to replace the conventional sandbag for head and neck surgeries. It involves the use of an empty irrigation bottle, a valve and suction tubing. Its shape and volume is readily adjustable by altering the volume of inflated air. Moreover, compressible air moulds the bag to the curvature of the patient's external surface reducing the risk of pressure sores in prolonged surgery. Ultimately this serves as an innovative

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technique which is financially savvy with the use of recyclable items.

Keywords: Innovative, sandbag, positioning, airbag

Patient positioning is a vital step in preparing a patient for surgery. The aim of positioning of a surgical patient should ensure comfort, dignity, and allow good access to the operative site, while minimizing risk of injury to the patient (Knight & Mahajan 2004). Certain surgical procedures require specific positioning as wrong positions may interfere with the surgical technique resulting in intra-operative technical difficulty.

Patient positioning may be regarded as a pertinent constituent of surgical planning (Knight & Mahajan 2004; Rozet & Vavilala 2007). The ideal patient position involves balancing surgical comfort to both the surgeon and patient (Rozet & Vavilala 2007). Among the usual apparatus used to position patient is an air bag placed beneath the shoulders for a hyperextended neck, mainly in cleft lip & palate repair, and head and neck surgeries. We discuss how certain surgical positions achieved via re-using items readily available in operating theatres.

A 60-year-old Malay male, with no known prior medical illness presented with an anterior chest wall swelling, gradually increasing in size for the past 10 years. Initially, the patient was asymptomatic until recent six months during which he started to exhibit constitutional symptoms of malignancy such as of weight loss. Otherwise, the only complaint was the anterior chest wall mass. On examination, the mass

was 6 by 4 cms, oval in shape, firm, mobile and not pulsatile. There were no superficial skin changes.

Computer Topographic (CT) imaging showed a large hetero-genous enhancing and lobulated anterior mediastinal mass with local invasion to the sternum and ribs. Imaging also showed the right thyroid gland was enlarged with a large hypo-dense lesion, coarse calcification present within the lesion. The thyroid mass extended from the level of C4 vertebra down to the level of the clavicle, displacing the trachea laterally to the left, conserving the trachea patency. Numerous sub-centimetre mediastinal lymph nodes were present. Subsequent fine needle aspiration cytology (FNAC) was highly suspicious of underlying thyroid follicular carcinoma.

Multi-disciplinary team was assembled to tackle the highly suspicious of thyroid malignancy, anterior chest wall mass and for the reconstruction and wound closure of the huge anterior chest wall defect. Intra-operative positioning of the patient involving different surgical disciplines needs different patient positional requirements. This is to accommodate for an adequate surgical field exposure, sufficient area for the anaesthetist to maintain homeostasis and minimizing risk of injury to the patient. Reusable items which are readily available in the operation theatre were modified as inflatable air bags was used to



Figure 1: A 3 l saline irrigation bag with stopper is placed in one tube. A piece of suction tubing connects the other end to a 3-way stopper



Figure 2: A second piece of suction tubing connects the 3-way stopper to a sphygmomanometer bulb for intra-operative inflation and deflation. Completed inflatable air bag for patient positioning (below)

position patients accordingly before the operation begins. Firstly, a 3 l saline irrigation bag was procured once its fluid contents were emptied and dried out. Then, a stopper was placed in one tube while the other end to a 3-way valve via a suction tubing (Figure 1). A second piece of suction tubing connected the 3-way stopper to a manually controlled sphygmomanometer bulb (Figure2).

Post-operatively, patient recovered from surgery without major complications; not from patient positioning and preparation. Input from oncology, rehabilitation and physiotherapy was obtained to enhance patient recovery.

Surgical positioning before surgery is a vital part of surgical planning. Different surgical disciplines in general, have their own preference so as to know which position is best and ideal for performing certain procedures. Head and neck surgeries usually prefer a hyperextended neck to get good access to the anatomically tight neck area and avoid hindrance from other surrounding structures mainly the shoulders. Orthopaedics specialities such as spinal instrumentations require

patients to be in prone position as it is almost impossible to get access from the anterior aspect of the body.

Appropriate surgical patient positioning is not only important for the surgeon but to the supporting staff as well, especially for the anaesthetist and the circulating staff to prevent serious adverse events and complications (Rozet & Vavilala 2007). Patients are under general anaesthesia and are unable to care for themselves or signal medical staff of impending injuries. Among common complications from poorly positioned patients during surgery, it includes peripheral nerve injuries, ocular injuries, and pressure sores (Knight & Mahajan 2004).

With reference to the case discussed, access to the neck is crucial in view of small access to the neck area and the grossly enlarged thyroid gland which is highly suspicious of malignancy. Adequate exposure will assist the surgeons to dissect the area better, identifying vital structures more easily as well as able to resect structures better without injuring the surrounding

structures (Wisner & Jacoby 2004).

To achieve an adequate hyperextended neck, few techniques have been described; mainly via using sand bags or inflatable air bags (Wisner & Jacoby 2004). This apparatus is placed beneath the shoulder at the level of the scapula blades, raising the body slightly allowing the neck to be extended to a certain degree. Advantages of using a sand bag is that the sand bag area is usually better in fixing the body to the same position but not easily adjustable as sand bag usually comes in a fixed shape and volume (Wisner & Jacoby 2004; Collins et al. 2012). Air bags on the other hand uses inflated air into a bag placed behind the shoulder (similar to the sand bag). Air bags settings can be modified more readily by adjusting the amount of air inflated. However, air is compressible and therefore patients' position could alter with certain movements during the surgery (Wisner & Jacoby 2004; Collins et al. 2012).

Another advantage of using an air bag is the apparatus is easily replicable and reproducible via items readily available in the operation theatre. For this case, a used (empty) normal saline bag was connected to a hand pump as diagram showed above. The empty bag was placed beneath the shoulders and inflated accordingly to achieve the desired position required. This can be recycled and reproducible as these items are usually thrown away after use and could cut cost massively. There is no need for maintenance for this in house designed air bag as the hand pump can be stored easily in the OT cabinet whereas the used bag is almost

always available since fluid is always used by anaesthetist in OT.

This air-bag is not only used for head and neck and chest surgery but also in positioning our cleft lip and palate children during their cleft repair procedures.

Surgical patient positioning is important aspect of the surgical planning and necessary to determine the surgery success. There are multiple modalities and ways to position the patient to the surgeons' desire, but financial constraints is a major issue in healthcare nowadays. In-house inflatable air bag is a creative way of positioning a surgical patient and an evolution to cut healthcare cost worldwide.

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REFERENCES

- Collins S, Lehman DS, McDougall EM, Clayman RV, Landman J. 2012. *AUA BLUS Handbook of Laparoscopic and Robotic Fundamentals*. American Urological Association Education & Research, Inc. available at <https://www.auanet.org/education/blus-handbook.cfm>. [31st July 2015].
- Knight DJW, Mahajan RP. 2004. Patient positioning in anaesthesia. *Contin Educ Anaesth Crit Care Pain* 4(5): 160-163.
- Rozet, I, Vavilala, M.S. 2007. Risks and benefits of patient positioning during neurosurgical care. *Anesthesiol Clin* 25(3): 631-653.
- Wisner DH, Jacoby RC. 2004. Injuries to the neck. In *ACS Surgery: Principle and Practice*. <https://cirugiatraumaponiente.files.wordpress.com/2010/07/cuello.pdf>. [1 Jan 2016].