[Indian J Chest Dis Allied Sci 2010;52:175-176]

Correspondence

Improvised Chest Tube Valve for Intra-hospital Patient Transportation

To the Editor: Joshi's review work[1] (October – December 2009). The author inspired by the recent review which describes the ambulatory chest drainage techniques and where she credits to Heimlich the original description of the flutter valve-drain based on rubber materials. The author propose a personal methodology about flutter valve based on the early descriptions and with the aim to facilitate the movement of patients carrying chest tubes inside the hospital by its temporary use as a replacement for the drainage system. The basic principle of this system had already been described by Tiegel[2] one hundred years ago and the most simple manner regarding its applicability is that perforated rubber glove's finger secured to a needle or pleural catheter. Such technique was widely used in sucking wound treatments in the battlefields during the Second World War,[3] and in some places its use has been extended as an auxiliary method during the intra-hospital transportation of patients with chest tubes.[4] As an attempt to improve this last technique in patients with chest tubes who need be transferred to different hospital services, we have secured the glove's finger to a connector so allowing an easy adaptation to the pleural tube or the wall suction tubing for verification purposes of the one-way valve effect (see Figure). When necessary, the intentional soaking of the glove's finger with lidocaine atomisation liquid or an antiseptic solution increases its adhesion and collapsibility properties during suction and, consequently, its reliable safety. The materials required are relatively inexpensive which allows that the valve be made and discarded multiple times for as long as the patient remains with the pleural tube.

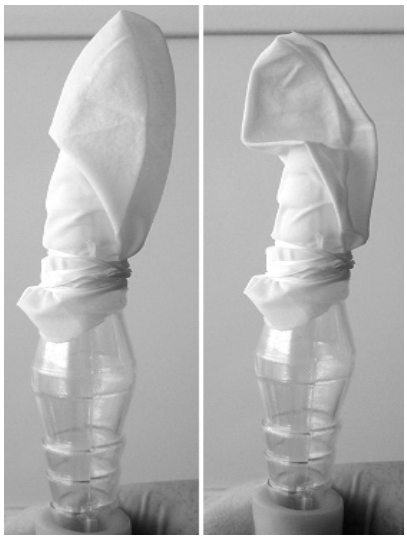

Figure. Air leak testing for a finger glove valve with aid of wall vacuum source. *Right*, perforated glove finger is attached to the connector and distal end of the suction tube. *Left*, as vacuum is created the finger glove must collapse at the same time that wall regulator gauge is deflecting.

The Heimlich valve is currently considered as the most practical method commercially available. However, the valve comes in a kit including additional accessories that increases its cost even more and thus, making the daily use difficult during the patient's stay in the hospital while at the same time is keeping its sterile conditions. The suggested methodology although not recommended for outpatients permits that subgroup of hospitalised patients with chest drains to be able to move inside the hospital without the need from water seal or tube clamping which might become damaged or provoke a tension pneumothorax.

The author has no conflicts of interest with regard to this research or its funding.

Rene Agustin Flores-Franco
Regional General Hospital
Health State System
510 Colon and Teofilo Borunda Av.
Col. Centro, CP 31000
Phone: +614 4160530
Chihuahua, Chih., Mexico
E-mail: rflores99@Prontomail.com

REFERENCES

1. Joshi JM. Ambulatory chest drainage. *Indian J Chest Dis Allied Sci* 2009;51:225-31.
2. Meyer W. On drainage after thoracic operations with special reference to the oesophagus. *Ann Surg* 1912; LIV:100-10.
3. Molnar TF, Hasse J, Jeyasingham DK, Rendeki MS. Changing dogmas: history of development in treatment modalities of traumatic pneumothorax, hemothorax, and posttraumatic empyema thoracis. *Ann Thorac Surg* 2004;77:372-8.
4. Sim KM, Ng ASB. A questionnaire survey on practice of chest tube management. *Singapore Med J* 1996;37:572-6.

The Author's reply: I thank Dr Flores-Franco for the interest shown in my recent review article *"Ambulatory Chest Drainage"*. Although various ambulatory approaches have been described for chest drainage, most care givers continue to use the standard underwater drainage (UWD). The

cumbersome UWD system has several drawbacks; the most important of which are a lack of ambulation during the period of intubation. The purpose of the review was to describe the available alternative ambulatory drainage systems. These systems can be used successfully in ambulatory settings, with lower complication rates and reduced medical expenses.[2]

Flores-Franco describes an interesting method to facilitate the movement of patients carrying chest tubes inside the hospital. It is a modification to the perforated rubber glove's finger secured to a needle (see Figure), which was described originally by Birch[3] for the management of pneumothorax. Although both methods are meant for temporary use, these techniques add to the options for ambulatory chest drainage.

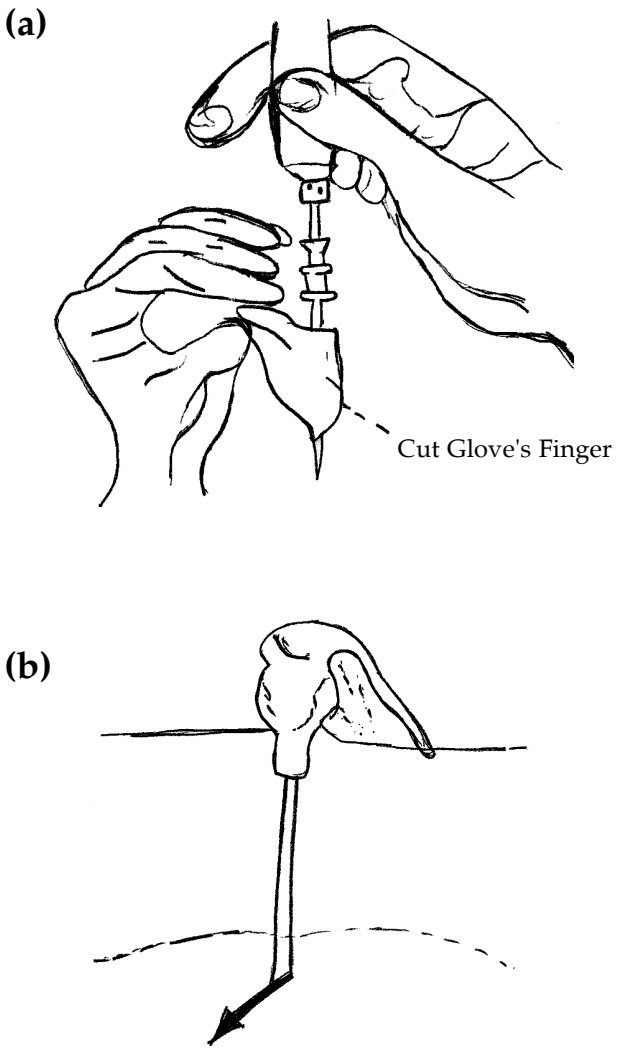

Figure. Showing *(a)* needle being inserted into a cut glove's finger, *(b)* needle with the cut glove's finger in the pleural space draining air during expiration, and *(c)* glove's finger collapsing during inspiration allowing one way drainage.

J.M. Joshi,
Professor and Head
Department of Pulmonary Medicine,
T.N. Medical College and B.Y.L. Nair Hospital,
Mumbai – 400 008;
Phone: 91-022-23081490, Extn 642, 643
Fax: 91-022-23003095
E-mail: drjoshijm@gmail.com

REFERENCES

1. Joshi JM. Ambulatory chest drainage. *Indian J Chest Dis Allied Sci* 2009;21:225-31.
2. Choi SH, Lee SW, Hong YS, Kim SJ, Moon JD, Moon SW. Can spontaneous pneumothorax patients be treated by ambulatory care management? *Eur J Cardiothorac Surg* 2007;31:491-5.
3. Birch CA. *Emergencies in Medical Practice;* 8th edn. London: Livingstone;1967:p.164.