



Chest Tube Removal Time in Trauma Patients on Positive Ventilation Pressure: A Randomized Clinical Trial

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Dear Editor,

I read with regard to the article entitled "Chest Tube Removal Time in Trauma Patients on Positive Ventilation Pressure: A Randomized Clinical Trial" by Abbasi *et al.*, [1] published in your journal, I would like to make the following comments. First, I congratulate the authors on their great work on such a challengeable topic, the controversial issue of the optimal method for insertion [2,3] and removal [4] of chest tubes from trauma patients under positive ventilation pressure. The factors affecting the rates of recurrent pneumothorax after chest tube removal are speedy action, quick closure, and the extent of effort made by the surgeon in conducting Valsalva's maneuver [5]. Clamping of the drain 24 hours before removal is necessary according to some authors while some believe that it is only beneficial in patients with a persistent air leak [4,6]. There is no agreement on the timing of the removal of the chest tubes, although according to Abbasi *et al.*, [1], early removal provides more comfort for the patient and also results in shorter hospitalization.

Sharma *et al.*, [6] reported that recurrent pneumothorax occurred in 25% of patients after removal of the tube six hours following re-expansion in patients with spontaneous pneumothorax. Baumann [7] concluded that there is a need for a more optimal method and that further studies are required to determine the patient's response. Some authors are in favor of removal at end-expiration or during Valsalva's maneuver, but others suggest removal at end-inspiration. Miller and Sahn [8]

suggested removal during Valsalva's maneuver or at end-expiration. Coughlin and Parchinsky [9] reported the advantages of removing the tube with a brisk firm movement at end-expiration. Welch [10] suggested removal at end-inspiration while the patients were holding their breath. It is also recommended by some researchers to use continuous suction to prevent complications during removal [4].

Removal of the chest tubes during end-expiration without suction resulted in a significant increase in recurrent pneumothorax rates compared with removal at end-inspiration with suction. Recurrent pneumothorax is reported as 2-24%, and reinsertion of a chest tube as 1-6% [4,5].

I believe it will be safer to remove the chest tube according to following criteria:

1. Normal chest X-ray or present of pneumothorax <15% (by using Fio₂ 100% and flow of 15cm H₂O the remaining air will be absorb).
2. No active Bubbling air or leak cessation for at least 4h.
3. Fluid drainage of less than 100 up to 450 ml per day (nonchylous) or drainage < 10 cc/hr in 6 hr pre-removal [11]
4. Clamping of the tube for 12 to 24 hours.
5. No air accommodation in second X-ray.
6. Chest tube must be removal during maximum inspiration by suctioning or during Valsalva's maneuver or at end-expiration.

Conflict of Interest: None declared.

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