

4. THORACIC INJURY
B. Occult Pneumothorax

OBJECTIVE: To define the treatment of occult pneumothorax (OPTX)

GUIDELINES:

OPTX is defined as a PTX not identified on plain CXR but only on CT scan imaging. The incidence ranges from 2% to 10%, with some authors suggesting up to 20%. There are no specific predictive models that can discriminate which patients will require tube thoracostomy in the form of either a chest tube (CT) or a pigtail catheter. Historically, the implementation of positive pressure ventilation (PPV) in a patient with OPTX was deemed to predispose the patient to a higher risk of tension PTX; therefore, placement of CT was deemed necessary. It is now clear that the application of PPV does not necessarily convert an OPTX in a radiologically detectable or tension PTX¹ (Level 3). The most reliable predictor of tube thoracostomy is progression of the OPTX to a radiologically detectable PTX on CXR and the occurrence of respiratory distress with a > 90% and > 80% need for CT with the progression of OPTX and respiratory distress, respectively².

Based on the available evidence, OPTX should be observed even when PPV is required. A repeat chest X-ray should be obtained in 4 hours. The overall failure of observation is < 10% without increased morbidity and mortality. Progression of the OPTX to a radiologically detectable PTX on repeat plain CXR and/or the occurrence of respiratory distress requires placement of either a pigtail catheter or a small size chest tube^{2,3}.

Disposition and Management

1. Patients should be admitted to the floor, step down, or ICU, based on criteria in [Chapter 4 A](#). Telemetry with continuous pulse oximetry monitoring should be used.
2. A repeat Chest X-ray should be performed 4 hours after the previous one.
3. Tube thoracostomy should be performed based on the patient's clinical status and conversion to pneumothorax visible on Chest X-ray.

References:

1. MA de-Moya et al: Occult Pneumothorax in Trauma Patients: Development of an Objective Scoring System J Trauma 1999;46:987-990
2. Moore FO et al: Blunt Traumatic Occult Pneumothorax: Is Observation Safe? Results of a Prospective, AAST Multicenter Study J Trauma 2011; 70:1019 – 1025
3. Wolfman NT et al: Validity of CT Classification on Management of Occult Pneumothorax: A Prospective Study AJR 1998; 171: 1317 – 1320
4. Smith, J. A., Secombe, P., & Aromataris, E. (2021). Conservative management of occult pneumothorax in mechanically ventilated patients: A systematic review and meta-analysis. *Journal of Trauma and Acute Care Surgery*, 91(6), 1025–1040. <https://doi.org/10.1097/ta.0000000000003322>

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