Thoracic Irrigation Protocol

Purpose:

1. To describe the indications for thoracic irrigation
2. To detail supplies needed
3. To describe the procedure for thoracic irrigation
4. To describe the management of chest tube post irrigation

Indications for thoracic irrigation:

Thoracic irrigation reduces the odds of a secondary intervention for rHTX-related complications by 44% [1].

1. Any pt with >14Fr thoracostomy tube (CT) in place for hemothorax (HTX).

The multicentered study that this protocol is largely based on used CT >28Fr [1]. However, a prospective multicenter randomized trial done by Kulvatunyou et all concluded that 14Fr percutaneous catheters are as effective at draining traumatic htx as their larger bore counterparts [3].

Another recent prospective case series [4] reported that htx evacuation and thoracic irrigation were feasible through a 14Fr percutaneous pleural catheter and further investigation via multicentered trials were warranted.

2. Done at the initial placement of CT in trauma bay or within 24hrs of CT placement (in the trauma bay).

Supplies needed:

1. Standard Thoracostomy Tube Tray or Cook Catheter pleural pigtail tray
2. 14-28 French Thoracostomy Tube (CT)
3. 2x500mL of bags of sterile WARM normal saline
4. Sterile suction tubing and pleur-evac
5. Y connector

6. Cysto tubing (T-U-R Y-Set)

7. Sterile drapes and chlorhexidine wand

Procedure Steps:

1. A 14-28 French CT (per attending preference) is placed utilizing standard aseptic technique. This is to be done under the supervision of the Fellow or the Trauma Attending.

2. Connect the CT to the atrium

• This is maintained until no return of effluent.

• Operative Intervention pursued in the setting of initial output >1500mL.

3. Record amount of hemothorax drained.

4. The Cysto tubing and 2x500mL bags of warm saline are then spiked. Disconnect the CT from the pleur-evac tubing, keeping the ends sterile. Using a Y connector hook one end to the CT, and the other two ends to the cysto tubing and wall suction tubing respectively.

5. Clamp the suction and instill the first 500mL of warm sterile saline.

6. Once 500ml has been instilled, clamp the cysto tubing and release the clamp from the suction tubing. Evacuate the 500ml of saline instilled.

7. Steps 6-6 are repeated once more for a total of 1,000mL of irrigation. Data has shown that the instillation of at least 1 liter of saline results in decreased LOS [2].

8. Record amount of fluid removed following irrigation. Once the above steps are complete connect to pleur-evac at -20mmHg.

Chest tube management post irrigation:

1. CT is connected to a standard atrium and placed to -20mmHg suction for the first 24 hours With no air leak place CT to water seal after initial 24hrs regardless of output. Repeat CXR at 4hrs after water seal.

References:

1. Carver TW, Berndtson AE, McNickle AG, Boyle KA, Haan JM, Campion EM, Biffl WL, Carroll AN, Sise MJ, Berndt KS, Burris JM, Kopelman TR, Blank JJ, Seamon MJ, Peschman JR, Morris RS, Kugler NW, Conrardy RD, Szabo A, de Moya MA. Thoracic irrigation for prevention of secondary intervention after thoracostomy tube drainage for hemothorax: A Western Trauma Association multi-center study. J Trauma Acute Care Surg. 2024 May 20. doi: 10.1097/TA.0000000000004364. Epub ahead of print. PMID: 38764139.

2. Laura Crankshaw, Allison G. McNickle, Kavita Batra, Deborah A. Kuhls, Paul J. Chestovich, Douglas R. Fraser, The Volume of Thoracic Irrigation Is Associated With Length of Stay in Patients With Traumatic Hemothorax, Journal of Surgical Research, Volume 279, 2022, Pages 62-71, ISSN 0022-4804, https://doi.org/10.1016/j.jss.2022.05.031.

3. Kulvatunyou N, Bauman ZM, Zein Edine SB, de Moya M, Krause C, Mukherjee K, Gries L, Tang AL, Joseph B, Rhee P. The small (14 Fr) percutaneous catheter (P-CAT) versus large (28-32 Fr) open chest tube for traumatic hemothorax: A multicenter randomized clinical trial. J Trauma Acute Care Surg. 2021 Nov 1;91(5):809-813. doi: 10.1097/TA.0000000000003180. PMID: 33843831.

4. McLauchlan N, Ali A, Beyer CA, Brinson MM, Joergensen SM, Yelon J, Dumas RP, Vella MA, Cannon JW. Percutaneous thoracostomy with thoracic lavage for traumatic hemothorax: a performance improvement initiative. Trauma Surg Acute Care Open. 2024 Feb 29;9(1):e001298. doi: 10.1136/tsaco-2023-001298. PMID: 38440095; PMCID: PMC10910477.