Chest Trauma Management with Small-Bore Chest Tube

In general, large-bore (32-to 36-Fr) chest tubes (CTs) should be inserted for chest trauma management. However, some investigators have described the efficacy of the management with small-bore CTs (SBCTs) for chest trauma. Herein, we described the outcome of cases of chest trauma patients inserted with SBCTs in our institute. Cases of patients with chest trauma managed with a SBCT were identified through chart review from April 2011 to March 2015. The CTs were manufactured by Covidien Japan, Tokyo. The methods of CT insertion were not uniform: Some were inserted with the Seldinger technique and others with an open technique. The size and insertion site of the CT depended on the surgeon. The defined guidelines for when to remove CTs were not available. The timing of removal of CTs depended on the surgeon. In cases of haemothorax (HTX), CTs were removed when the amount of drainage in the tube decreased to less than approximately 200 mL/day.

Over the 5-year period, 62 CTs were inserted in 50 patients with chest trauma. All patients had suffered blunt trauma. Table 1 shows the demographics and outcomes of this study. The median size of CT was 20-Fr. Additional tubes were inserted in six cases (9.7%; 95% confidence interval, 4.7–20.1) because of failure to evacuate the pneumothorax in five patients and malpositioning in 1. All evacuations of HTX were successful.

In this observational study, the rate of re-insertion was 9.7% (95%CI, 4.7–20.1) and sufficiently acceptable for clinical use. In all cases, evacuation of HTX was successful, and there was no case of retained HTX. CTs of size 20-Fr may thus be adequate for evacuating HTX.

We therefore suggest the following treatment strategy: In the treatment of chest trauma patient, SBCT is selected initially and additional tubes are inserted as necessary.

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**Conflicts of interest**

There are no conflicts of interest.

**Table 1: Demographics and outcomes of this study**

| Variable                        | Value                  |
|---------------------------------|------------------------|
| Age                             | 66 (50–79)             |
| Sex                             | 72% male               |
| Height                          | 163 (155–168) cm       |
| Body weight                     | 59 (48–68) kg          |
| ISS                             | 20 (17–35)             |
| Chest AIS                       | 4 (3–4)                |
| CT size                         | 20 (16–20) Fr          |
| CT placement days               | 6 (4–9) days           |
| Type of chest trauma            |                        |
| Pneumothorax                    | 22 cases               |
| Haemothorax                     | 11 cases               |
| Pneumohaemothorax               | 27 cases               |
| Positive ventilation            | 12 cases (NIV in 10 cases) |
| Additional Tube Insertion       | 6 cases [9.7% (95% CI, 4.7–20.1)] |
| Mortality                       | 12 cases (24%)         |

ISS: injury severity score, AIS: abbreviated injury score, CT: chest tube, NIV: non-invasive ventilation, CI: confidence interval
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