Is Fibreoptic Percutaneous Tracheostomy in ICU A Breakthrough

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ABSTRACT

**Background:** In ICUs, bedside percutaneous tracheostomy (pct) is commonly performed, but it is associated with certain drawbacks as paratracheal placement, posterior tracheal wall injury and tracheoesophageal fistula. To address these fibreoptic bronchoscope (FOB) guided PCT was introduced. We aimed to compare both these methods.

**Patients & Methods:** We compared 60 age & sex matched patients into two groups of 30 each. In group 1 tracheostomy was performed by the conventional Ciaglia’s method. In group 2, a fibreoptic bronchoscope was used in addition with the aid of an assistant.

**Results:** The fiberoptic method took more time than the conventional method. (18±3min vs 15±2min (p=0.001)). The average no. of attempts at insertion of needle was 2.4 in group 1 and 1.2 in group 2 (p=0.001). The fall in SpO2 to <90% was seen in 1 patient in group 1 and in 6 patients in group 2, so much so that the procedure had to be abandoned in 2 patients.

**Conclusion:** FOB though definitely advantageous over CPCT in terms of lesser complications and being highly useful in the obese, short necked, and those with scar marks, is not without drawbacks such as requirement of additional staff and increased expenditure. The main being inability to be used in patients with low respiratory reserve. Overall it would be complimentary for any ICU to have FOB facility and must be used in select group of patients.

KEYWORDS:
was similar to group 1. A postprocedure chest Xray was performed in all as a precautionary measure.

The parameters observed included
- Duration of procedure from skin puncture to insertion of cannula
- No. of attempts at skin puncture
- Complications, if any
- Oxygen saturation
- Preprocedure & postprocedure arterial pH & pCO2.

Exclusion Criteria
- Age<18, >65
- Coagulation disorders

RESULTS

The fiberoptic method took more time than the conventional method. The mean time to perform the procedure was 15±2min in group 1 and 18±3min in group 2 (p=0.001). The average no. of attempts at insertion of needle was 2.2 in group 1 and 1.2 in group 2 (p=0.001) (Table 1). The fall in SpO2 to <90% was seen in 1 patient in group 1 and in 6 patients in group 2, so much so that the procedure had to be abandoned in 2 patients. The change in pH and pCO2 was within 10% in both the groups. Hemmorhage was seen in 3 patients in group 1 and 2 in group 2. 3 patients in group 1 suffered paratracheal placement, while none in group 2. In 1 patient in group 1 we encountered posterior tracheal wall injury leading to tracheoesophageal fistula formation (Table 2).

| Parameters       | Group 1 | Group 2 | p value |
|------------------|---------|---------|---------|
| Duration (min)   | 15±2    | 18±3    | 0.001   |
| Attempts         | 2.2     | 1.2     | 0.001   |
| pH               | 7.34±0.04 | 7.35±0.06 | 0.12    |
| pCO2             | 34±2    | 32±3    | 0.14    |

| Complications    | Group 1 | Group 2 |
|------------------|---------|---------|
| Fall in SpO2     | 1       | 6       |
| Haemmorhage      | 3       | 2       |
| Paratracheal Placement | 3   | 0       |
| Tracheoesophageal Fistula | 1  | 0       |
DISCUSSION

FOB PCT took on an average more time than CPCT, but it required lesser no. of attempts and had no complications as regards to posterior tracheal wall injury or paratracheal placement. FOB did not offer any direct advantage in controlling haemorrhage. On the contrary it made the procedure more cumbersome by obscuring the view. Several reports state that fiberoptic tracheostomy is associated with hypercapnia and acidosis, with deleterious effects on ICT.\(^8,9\)

In our study, though in few patients there was repeated fall in O2 saturation, we did not encounter hypercapnia or acidosis, probably because we immediately withdrew the bronchoscope and administered 100% O2. Later on reviewing the records we found that this was because of low respiratory reserve due to underlying pathology such as ARDS. So FOB was not the primary cause of falling saturation.

FOB though definitely advantageous over CPCT in terms of lesser complications and being highly useful in the obese, short necked, and those with scar marks, is not without drawbacks such as requirement of additional staff and increased expenditure.\(^10\) The main being inability to be used in patients with low respiratory reserve. Overall it would be complimentary for any ICU to have FOB facility and must be used in select group of patients.

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