

A 'Y'-shaped connector as an indispensable component of paediatric bronchoscopy mask: A novel innovation!

Sir,

Fibre-optic bronchoscopy (FOB) has widespread diagnostic and therapeutic role in the form of its use in difficult intubation, bronchoalveolar lavage or biopsies. FOB-guided intubation in paediatric patients with difficult airway could be a challenge and the presence of craniofacial dysmorphisms presents additional challenges.^[1,2] Although awake FOB-guided intubation is recommended for intubation of patients with difficult airways, same may not be feasible in paediatric patients primarily because of cooperation issues.^[3] Some practitioners prefer performing fibre-optic intubation on anaesthetised and paralysed patients.^[2] Smaller airways, easy airway collapsibility at end expiration and reduced functional residual capacity make them susceptible to frequent desaturation during FOB, thus requiring frequent interruptions resulting in delay and at times abandonment of procedure.

The pre-procedural anaesthesia care in such scenarios can be rendered safe by the use of bronchoscopy masks which are designed to allow bag and mask ventilation (BMV) during FOB or allow prolonged attempts at FOB-guided intubation. A number of such masks are available, which have more or less a common design namely a standard mask with a 22 mm

central port and 1–2 ports of varying dimensions for introducing FOB. Some have provision for intubation and EtCO₂ monitoring.^[4,5] However, their price is a principal deterrent to their widespread use.

We describe an assembly, made with components commonly available in our operating rooms which can be assembled to serve the role of bronchoscopy mask. The components of this device [Figure 1a and b] include a transparent face mask, a 'Y'-shaped reusable connector used in paediatric anaesthesia circuits, a connector of 6.5 internal diameter (ID) sized endotracheal tube (ETT), three cut fingers portion and elastic ring from a disposable sterile glove.

'Y'-shaped connector is integral to this assembly. It has two limbs each having an ID of 6.5 mm and a 22 M main stem. Connector of 6.5 ID sized ETT is connected to one of the limbs of the connector and is used for attachment to the anaesthesia circuit. The cut fingers portion of the glove is stretched over the other limb of the connector and is secured using the elastic ring of the glove. Although 22 M main stem fits firmly in the standard 22F sized aperture of the face mask, it can be easily rotated to change the position of the two limbs depending on the choice of orotracheal or nasotracheal intubation [Figure 2a and b]. A small slit is made over these stretched pieces to facilitate entry of lubricated insertion cord of FOB and ETT. Use of three stretched cut fingers of the glove helps in minimising leak during BMV [Figure 3a and b]. Use of this assembly usually requires two to three operators with one operator holding the assembly and providing BMV while other operator performs FOB or intubation. A mask harness could be of great help in reducing operator fatigue in cases of prolonged bronchoscopy procedures.

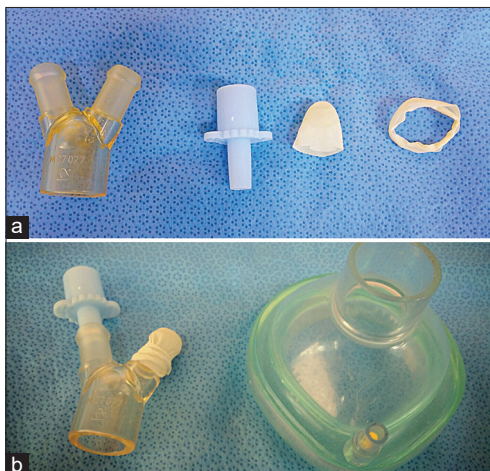


Figure 1: (a and b) Components of bronchoscopy mask

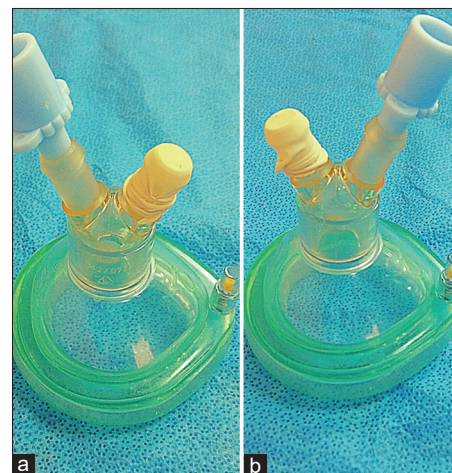


Figure 2: (a) Orientation of limbs for orotracheal intubation (b) orientation of limbs for nasotracheal intubation

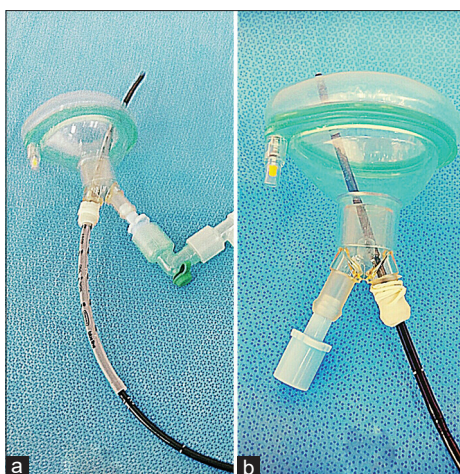


Figure 3: (a and b) Assembly with fibre-optic bronchoscopy and endotracheal tube of size 5.5 ID (ID: Internal diameter)

Paediatric patients are at high risk of hypoxaemia and hypercapnoea during FOB due to smaller diameter of airways and greater tendency towards airway collapse. In addition, there is increased airway resistance caused by the bronchoscope itself. BMV can help increase the width of the laryngeal space and reduces the tendency toward collapse of the lateral walls of the pharynx, which are the most sensitive upper airway structures. FOB in a spontaneously breathing child has been associated with reduced tidal volume and respiratory flow, which can be reverted with the use of BMV.^[6]

These components are easy to assemble and disassemble without damaging the individual components, FOB or ETT. The entire assembly is very economical since it employs the use of easily available components.

Limitation associated with this assembly is that it can be used only with un-cuffed ETT up to a size of 5.5 ID and whose connectors can be disconnected. The other limitation being that it can be used only with a face mask having 22F aperture. We have been successfully using this assembly in the paediatric patients undergoing bronchoscopic procedures or requiring FOB-guided intubation. This economical assembly has the potential of making paediatric FOB a much safer practice.

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Conflicts of interest

There are no conflicts of interest.

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