SAFETY DURING BRONCHOSCOPY

Pages with reference to book, From 146 To 148

Syed Nazim Hussain Bokhari (Department of Pulmonary Medicine, Shaikh Zayed Hospital, Lahore.)

Bronchoscöpy can only be learnt through observing and performing and not by reading manuals As in surgery experience gained is directly related to the number of procedures performed The procedure should not be performed unless there are valid indications and results or benefitsoutweigh the potential risks. Consideration should always be given to alternate method for obtaining same information[1]. However if bronchoscopy appears to be the best way of getting same information this is always indicated Complications can arise with increased frequency when the procedure is earned out by the staff under training or gaining experience In Pakistan practice of pulmonology is at pomitive stage, facilities for fibreoptic bronchoscopy is available only at selected centres, even in teaching institutions and only limited expencnce has been gained. The procedure is likelyto be introduced at more centres in near future. Present review is intended to provide information about the potential difficulties which may an se during the procedure.

HAZARDS OF BRONCHOSCOPY

In the long list of new departments added to pulmonology, bronchoscopy has been introduced at almost every teaching centre in developed countries. While rigid bronèhoscope remained in the domain of surgeons, physicians developed intense desire for early learning and routine application of fibreoptic bronchoscope[2], since its introduction in late sixties. At present, in pulmonary practice, bronchoscopy is the 3rd most common invasive procedure after arterial blood gases and thoracentesis[3]. Whether bronchoscopy is considered a procedure[4] or a science[5], it needs to be performed with an art. Availability of fibrescope to many countries around the world has resulted in an iâtrOepidemic. Based on experience and sound clinical judgement the procedure should be carried outwith firm indications whether useful information will emerge. The procedure may be employed in a variety of situations for both diagnostic as well as therapeutic purposes[6]. These include evaluation of focal and diffuse lung diseases, therapeutically for atelactasia[7] and foreign bodies for diagnosis of unexplained pleural effusion[8] and hemoptysis[9], diagnosis and staging of neoplasm[10], assessment of localised infection, bronchiectasis and slow resolving pneumonia[11] bronchial lavage in immunocompromised or sputum negative patients[12] laser therapy[13], diagnos tic biopsy procedures[14], evaluation of thoracic trauma[15], bronchography and in case of difficult intubation.

COMPLICATIONS

In experienced hands it is a safe procedure, however, complications[16] do occur, attributable, to the procedure lack of skill and failure to adequate monitoring of the patients. A large proportion of patients uñdërgoing procedure are highly susceptible and carry risk factors for the development of complications like smoking[17]. Complications can arise during premedication and preparation of the patient, technical problem may occur during insertion of the scope and often complications are associated with the procedure itself, biopsy, bronchial lavage and inadequate post-procedure monitoring. A major complication is one which is considered to endanger life or require urgent therapeutic intervention.

PREMEDICATION

Sedation with diazepam or morphine can lead to respiratory depression and acute respiratory failure, hypotension, syncope or hyperexitement. Among patients with COPD, fall in FEY by 10% and rise in airway resistance by 30% was observed 15 minutes after the procedure[18]. Sedation may have an additive adverse effect. Almost 50% of all major complications during the procedure are related to sedatives and local anaesthetics. With adequate anaesthesia there may be no need of premedication[19], particularly in the presence of obstructive airway disease. Asthma and COPD patients may be given hydrocortisones, atropine and nebulised salbutamol as premedication and lavage fluid should be limited to 200-300 ml at body temperature.

LOCAL ANAESTHESIA

Lignocain is used in form of 2-4% spray and 2% gel for local a esthesia. Inhaled lignocain can anaesthetise upto midtr chea. With maximum recommended dose of 300-400 mg[20] a blood level of 30-50% may be achieved through mucosal absorption[21]. In a normal person complications with lignocain are rare as much of this is aspirated out Patients with bronchial hyper-reactivity may get severe bronchospasm. This response is not related to airway; histamine-responsiveness or to the preservatives in the lignocain preparation[22]. Other adverse effects include hypersensitivity reaction and cardiorespiratory arrest. Potentially lignocain can interfere with the growth of aerobes anaerobes, fungi, mycobacteria[23] and impair the function of pulmonary alveolar macrophages and other immune competent cells, however, the concentration of aspirated lignocain has been found to be too low[24]. Rapid absorption oflignocain from inflamed mucosa[25] can result in toxic level (>6ug/ml).' Signs of toxicity are directly related to the free plasma fraction of lignocain, this in turn is inversely proportional to the level of plasma alpha-i acid glycoprotein (AAG) which can rise in. case of malignancy or thoracic trauma. Higher level of lignocain is tolerable if no rise in free form is achieved.

INSERTION OF BRONCHOSCOPE

Amount of pressure required to insert a bronchoscope is a matter of experience and learning. As asym-metry of nasal passages is not uncommOn, gentle attempt should be made to find more patent side. Saline lavage of nasal passage, topical vasoconstriction and rotatory movements of scope may help facilitate effective and safe passage. In case of inadequate anaesthesia laryngial and broncho-spasm can occut, resulting in hypoxia which may lead to seizures or cardiac arrhytbmias. On an average there is fall in P02 by 20 mmHg, particularly ml at body temperature. during suction and rise in PCO226; Fall P02 may persist for many hours and supplemental 02 is recommended as a routine[16] during the procedure, particularly for high risk patients[27].

MONITORING DURING PROCEDURE

During the procedure monitoring of the patient is required by an assistant, as bronchoscopist -is often so engrossed in the endoscopic fin4ings that physiological condition of the patient is forgotten. As patient is not under general anaesthesia, minimum conversation about the findings during the procedure will lessen patient's anxiety with minimal complications.

BIOPSY PROCEDURES

Incidence of complications is increased 20 times when biopsy procedures are carried out. Biopsies are only helpful if proper indications are sought for and proper information is collected through clinical and physical examination[28]. Transbronchial needle aspiration is safe in experienced hands and only minor complications are seen[29]. Complications of bronchial biopsy include pneumothorax[30] and haemorrhage. Intubation is needed in 40-50% of pneumothoraces. Small leak can occur after a delay, this does not need a routine post-procedure chest radiograph[31]. Risk of haemorrhage is minimised by having coagulation profile checked. Incidence of serious bleeding (>50 ml) is increased among

immuno-compromised and uraemic patients. Other complications include, vasovagal episodes, serious arrhythmias, myocardial infarction and pulmonary oedema. Fever and pulmonary infiltrate has also been noted following the procedure. During bronchoalveolar lange if tip of the bronchoscope is not wedged into an airway much of the instilled saline may be distributed to the adjacent or promixal airways. This may disseminate infection and even result in respiratory compromise.

FATALITY

Mortality rate as - low as 0.01-0.04% has been reported. Higher mortality and morbidity has been related to the procedure being carried out by the, staff under training. In two series by Suratt et al32 (48,000 procedures) and Simpson et al33 (40,000 procedures reviewed) causes of death have included reaction to topical anaesthesia, massive haemorrhage from bleeding tumour, myocardial infarction, chronic respiratory failure, severe pneumonia, bronchospasm and general anaesthesia. During another series by Herf et al[34], in 2,628 patients mortality rate of 0.5% was observed. The procedure may be best avoided among high risk patients, having severe hypoxia, serious arrhythmias, unstable angina, recent myocardial infarction and poor cooperation. Biopsy procedures are contraindicated in bleeding diathesis, uraemia, pulmonary hypertension, severe anaemia and in patients on mechanical ventilation or positive pressure breathing.

CONCLUSION

Fibreoptic bronchoscopy is a safe procedure even for a beginner[35], provided a little extra care is applied and procedure is carried out properly and rapidly in well selected patients, however, safety is no indication for routine use[36]. It is an aggressive bronchoscopist who is more likely to encounter complications than a conservatist.

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