

OXYGEN THERAPY IN SURGERY

INDICATIONS

The purely surgical indications for oxygen therapy are surprisingly numerous, chiefly due to investigative work done in the past five years. The indications listed below, while not exhaustive, are the major uses for oxygen in surgery.

Postoperative Pulmonary Atelectasis.

In this condition the relief of cyanosis, dyspnea, and the rapid pulse and respiratory rates by supplying oxygen in high concentrations may quickly relieve or diminish the symptoms. The BLB mask, the nasal catheter or the tent may be used in this condition.

Pulmonary Embolism.

Cases of embolism may benefit from the use of oxygen, particularly if used in conjunction with atropine and papaverine.

Cranio-cerebral Injuries.

It has been shown that these patients, particularly those who are unconscious, have a depression of the respiratory center and often have a marked reduction in the oxygen saturation of the blood. The saturation and the clinical condition of the patient is thus improved by the administration of oxygen, preferably by the BLB mask.

Postoperative Thyrotoxicosis.

The high oxygen consumption, increased pulse rate, temperature, air hunger, restlessness in this condition all indicate the use of high oxygen concentrations in the toxic post operative patient. The use of oxygen in such cases is as fundamental as the need for fluids. The tent is an advantage in these cases because of the cooling effect of controlled humidity. The mask or nasal catheter serve very well, however, and may be advantageous in those apprehensive patients who object to being enclosed in a tent.

Intestinal Obstruction.

Remarks made here apply equally to abdominal distention due to other causes. It has been found that 80% of the gas in the bowel in cases of intestinal obstruction is nitrogen, believed by many to be due to swallowed air. Some authorities question this source of origin of the gas. Despite the origin, it has been demonstrated that inhalation of 95 - 100% oxygen reduces the nitrogen tension 60% in the tissues in one hour. This permits the absorption and subsequent blowing off of the nitrogen from the lumen of the bowel and thus a reduction of the distention. Much of this work has been done by Fine and his associates. Fine believes that such high concentrations will cause no trouble over a 48 hour period but that the concentration should be decreased after this time to prevent pulmonary irritation. C. W. Mayo has suggested that oxygen may relieve gas pains. This has not been confirmed.

and for distention

Test for Viability of Bowel.

The administration of oxygen by the anesthetist in a case of questionably viable bowel may demonstrate immediately whether it should be resected or left alone by the immediate improvement in color or failure to improve.

Encephalography and Ventriculography.

The same factors operate in this instance as were mentioned above in the case of intestinal distention. 95 - 100% oxygen inhalations promptly relieve the headache, nausea, and vomiting in a high percentage of these cases. This is so effective that all cases should be given oxygen as soon as x-rays have been completed. The post spinal anesthesia headache is also said to be relieved by oxygen in a large percentage of cases, probably by the same mechanism.

Other Headaches.

Certain migraine and alcoholic headaches are sometimes dramatically relieved by oxygen inhalations.

Gas gangrene and Tetanus.

The increase of oxygen tension in the tissues of these anaerobic infections has been suggested as a therapeutic measure but has not received enough critical study at this time for evaluation. Possibly the relief of tension in tissues due to absorption of the nitrogen there may relieve pressure on the compromised circulation in an extremity.

Shock.

The increase in oxygen tension in the venous blood has been shown in cases of shock by oxygen administration. Whether this fact indicates diminution in anoxia is unknown. Some workers have calculated a 50% increase in oxygen tension in the tissues which is, of course, of material benefit if true. In the absence of more definite information it is believed that oxygen should be administered to those patients in severe shock.

Postoperative Use.

Although hardly indicated routinely it is of definite value in cases whose respiratory apparatus is severely compromised - as in chest injuries, particularly where the vital capacity is reduced. There is some danger of an increased incidence of atelectasis in such cases due to the complete filling of the alveoli and bronchi with a rapidly and completely absorbable gas.