Surgical Conditions

The safety of air travel following a surgical procedure is becoming an important issue with the increasing frequency of ambulatory surgery. It is not uncommon for a patient to travel by air, have an outpatient surgical procedure performed, and then return to home by plane soon after. Consideration must be given to the optimal timing of a postoperative flight, the assessment of patient stability, and special medical needs, such as pain management and precaution awareness.

General anesthesia, frequently used for ambulatory surgery, is not a contraindication to flying because the cardiac depressant effects and the changes in vascular resistance of anesthetic agents are rapidly reversible following emergence. In addition, the anesthetic gases do not predispose to decompression symptoms because of their low concentration, rapid equilibration, or both. Nitrous oxide at 70% concentration has poor tissue solubility and a short equilibration time (15 minutes). Halothane, ethrane, and isoflurane are used in low concentrations (1-4%) and rapidly equilibrate, making decompression effects unlikely. However, severe post-spinal headache precipitated by airline travel has been reported 7 days after a spinal anesthetic, possibly because of ambient cabin pressure changes inducing a dural leak (1).

It should be kept in mind, however, that postoperative patients are in a state of increased oxygen consumption due to the trauma of surgery, the possible presence of sepsis, and the increased adrenergic outflow. Concurrently, O_2 delivery may be decreased or fixed in patients who are elderly, volume depleted, anemic, or who have cardiopulmonary disease. Consequently, for such patients it may be wise to delay air travel for several days or provide medical O_2 during the flight. It must also be remembered that because of the decreased use of blood transfusions, many postoperative patients today are far more anemic than in the past. Where a hemoglobin of greater than 10.0 g was considered standard for a postoperative patient 10 years ago, now it is not uncommon to see younger patients with hemoglobins down to 7.0 g and elderly patients with hemoglobins down to 8.0 g.

A potentially dangerous situation is the postoperative elderly patient who is anemic and who has underlying coronary artery disease. This patient is in a physiological state of increased O_2 consumption and has a diminished and possibly fixed state of O_2 delivery. With coronary artery disease and limited vasodilational ability, limited coronary reserve would put this patient at risk (2). If travel is necessary, this patient would benefit from medical O_2 during flight.

Patients who have had a recent pneumonectomy or a pulmonary lobectomy have minimal pulmonary reserve. Of further significance is the fact that the majority of these patients have a long history of smoking with associated chronic obstructive pulmonary disease (COPD). Their narrow margin of pulmonary reserve may not become apparent until flight. Therefore, these patients must be carefully evaluated. If possible, the preflight evaluation should also include a hypoxia altitude simulation test (HAST). A ground level SaO_2 of greater than 90% (or a PaO_2 >70 mm Hg) usually does not require medical O_2 during flight.

It is important to remember that intestinal gas will expand 25% by volume at a cabin altitude of 8000 ft (2438 m). Post-abdominal surgery patients have a relative ileus for several days, thereby putting them at risk for tearing of suture lines, bleeding, and perforation. In addition, stretching gastric or intestinal mucosa may result in hemorrhage from ulcer or suture sites. To be safe, air travel should be discouraged for 1-2 weeks after the procedure. (The time could be reduced to 1 week if the intestinal lumen was not

opened.) Likewise, flight would be inadvisable for 24 hours following a colonoscopy with a polypectomy procedure because of the large amount of gas still often present in the colon and the risk of unexpected bleeding from the polypectomy site. A patient with an asymptomatic partial small or large bowel obstruction may also be unable to accommodate the gastrointestinal gas expansion during a flight, and should be advised not to travel by air.

Laparoscopic abdominal surgical procedures are less associated with ileus than open procedures and are not as restrictive. Flight can occur the next day if bloating symptoms are absent. The residual CO_2 gas in the intra-abdominal cavity following a laparoscopic procedure is rapidly diffused into the tissues and is not a factor.

Travelers with colostomies are not at increased risk during air travel, although intestinal distention may increase fecal output. Therefore, the use of a large colostomy bag is recommended. If a small bag is utilized frequent changes may be necessary.

Mechanical considerations may play a role in the travel of neurosurgical patients. Gas trapped within the skull will cause increased intracranial pressure when it expands at altitude. A person who has had air or any other gas introduced into the skull by trauma or an open or closed procedure (such as the now infrequently performed pneumoencephalograph) should have reliable evidence—a lateral skull film radiograph or CT scan—that the air or gas has been absorbed. If such information is not available, it is advisable to wait at least 7 days before traveling. Likewise, a person with a cerebrospinal fluid leak from any cause should not fly because of the possibility of backflow and microbial contamination due to the pressure changes within the cabin (3).

REFERENCES:

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3. Moser M. Fitness of civil aviation passengers to fly after ear surgery. Aviat Space Environ Med. 1990; 61:735-7.