Hemorrhage in Pulmonary Tuberculosis as a Surgical Emergency

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Fatalities from exsanguination in pulmonary hemorrhage are rare. Immediate fatalities occur as a rule by clot formation within the bronchial tree and asphyxia, but the sequellae with extension of the disease are more to be feared. Homolateral spread involving the lower lobe is favored by posturing the patient on the side from which the hemorrhage comes. Even more serious is contralateral spread which may convert a unilateral problem into bilateral disease with limitation or delay of surgical treatment.

Various authors have listed hemorrhage as one of the indications for pulmonary resection. In 1950 Ryan reported a case of tuberculosis in a young man who had repeated episodes of pulmonary hemorrhage over a period of several months and intermittent hemorrhage for about two weeks prior to the decision to do right pneumonectomy. This patient made excellent recovery. Ross reported right pneumonectomy for pulmonary hemorrhage in 1953, in a 45 year old woman. The hemorrhage had persisted for four days, bringing the hemoglobin to 51 per cent. Five days later severe hemorrhage began again and pneumonectomy was carried out. Postoperatively the patient was given chemotherapy with satisfactory recovery.

Severe pulmonary hemorrhage, when from well localized pulmonary lesions, should be treated as an emergency by surgery whether the basic pathology be lung abscess, tuberculosis or some other condition. Thoracic surgical techniques have now advanced so that under certain circumstances, pulmonary hemorrhage may be treated by resection on the same principle that severe hemorrhage from gastric ulcer has come to be treated by emergency gastrectomy. The corollary of the surgical approach to the treatment of severe pulmonary hemorrhage has been too much neglected. The usefulness of chemotherapy has changed the operability of pulmonary tuberculosis so the presence of this infection is not a contraindication to surgical excision of the diseased segment or segments if hemorrhage occurs.

Since hemorrhage carries with it the frequent and serious sequellae of spread of the disease into other lobes of the lung, pneumothorax was frequently performed to control it. More recently this therapeutic procedure was replaced by pneumoperitoneum and possibly phrenic phraxis. Thoracoplasty has been done. Lesions which cause hemorrhage are prone to require eventual collapse or resection. It is difficult to prove the efficacy of any procedure or medication in checking hemorrhage, except the eradication of the lesion.

At the time of pulmonary hemorrhage, the bronchial blood clot may set up conditions for bronchial ulceration and stenosis, and complete loss of function of that lung may follow (Fig. 1A).

Case 1. L. H.: Male, age 64 had tuberculosis since 1941. His past treatment consisted of a few months of intermittent, poorly controlled bed rest, and streptomycin under an internist, after bouts of hemorrhage, each of which left him with more involvement. Examination at the time of a severe hemorrhage in 1952 revealed bronchial stenosis and apparent complete destruction of the right lung. (Fig. 1B). At this time, but not during acute hemorrhage, pneumonectomy was performed (Fig. 1C). He has had negative sputum for two years and is now working as a salesman. Had he been offered resection during an earlier hemorrhage he would have been concerned enough to accept it at a time when the excision could have been limited to a lobe.

It seems probable that hemoptysis may be from either the bronchial arteries or pulmonary arteries, but that the more copious hemorrhages come from lesions of the branches of the pulmonary artery, eroded within cavity walls.

Case 2. E. A.: A case of pulmonary hemorrhage treated by pulmonary ligature. In 1944 we saw a 26 year old Spanish-American who had right thoracoplasty two years before. Active tuberculosis and bronchiectasis underneath the thoracoplasty was confirmed by bronchograms. He had repeated hemorrhages during the two months prior to operation. The pulmonary artery was isolated and ligated, but pneumonectomy was not completed because of technical difficulties. Postoperatively the sputum converted and remained negative. No further hemorrhage has occurred.

Any hemoptysis of small or moderate degree should alert the physician to the possibility of massive hemorrhage, and elective surgery may be carried out, but should severe bleeding develop, the emergency procedure may be required. Localization of the site of hemorrhage is an essential prerequisite to emergency surgery. The source of gastrointestinal hemorrhage may be more difficult to identify even with the abdomen open, but in chest conditions localization is more definite. Previous x-ray examinations are usually obtainable. Clinicians dealing with tuberculosis classify patients as to potentialities for surgical treatment and may be able to designate the probable origin in case hemorrhage intervenes. With x-ray film follow-up studies of tuberculosis patients the physician may be ready for emergency care in case of severe pulmonary hemorrhage. What segment or segments would be the most likely sources of hemorrhage? At the time of hemorrhage, localization of the site may be aided by physical examination. Final decision may be made at the time of projected surgery by preliminary bronchoscopic inspection of the bronchial tree.

Case 3. S. B.: This 40 year old colored male was well until January 1963. At that time he had a “cold” and following this he had vague aches and malaise. In June 1963 his physician sent him for x-ray films of the chest (Fig. 2A), which showed shadows in the right upper suggestive of tuberculosis. Further studies were not made and he continued to lose strength. His appetite was poor and he lost 20 pounds during the following 10 weeks. There was some increasing cough and expectoration to about one-half ounce of sputum daily. Pain in the right chest developed and another x-ray film was made in mid-August 1963. He stated that he had been having night sweats and sleeplessness. About two weeks before there had been a small hemoptysis.

Physical Examination: He was in poor general condition. His weight was 137. height 68", temperature 97.4, pulse 82, blood pressure 102/76. The skin was wrinkled and dry. Many teeth were carious. There were fine crepitations after cough, and bronchial quality of the breath sounds over the right upper chest. The fluoroscope showed a dense, solid upper lobe shadow on the right with a sharp line of demarcation between this lobe and the remaining lung, indicating possible bronchial obstruction. X-ray film (Fig. 2B) confirmed this finding. A bronchial lavage was reported positive for acid-fast bacilli. He was placed on combined chemotherapy, with streptomycin, para-aminosalicylic acid and isoniazid (Fig. 2C). Lobectomy at some future date was planned and discussed with the patient. Two days later he had a hemorrhage starting about 10 A.M. During the three hour interval to the beginning of surgery about 18
ounces of blood were coughed up. The blood count was, hemoglobin 11.4; hematocrit 36.5; white blood cells 6,350; lymphocytes 30; monocytes eight.

After anesthesia with demerol, pentothal, nitrous oxide and oxygen had been induced, a bronchoscopic examination was performed. A few cubic centimeters of partially clotted blood were aspirated from the bronchial tree and the lobar bronchus from which the bleeding came was demonstrated to be the right upper. With the patient in the face down position after the intratracheal tube was in place just above the carina, an airway was easily maintained. Small mounts of blood were aspirated by the anesthetist during the first part of the procedure. The posterior approach gave rapid access to the branches of the pulmonary artery to the upper lobe, which were ligated and divided before the dissection and occlusion of the bronchus. The procedure was completed in the retrograde direction as in segmental resections.

Pathology: The right upper lobe weighed 715 grams and was of rubbery consistency. On exploration of the cavity, which measured approximately 2 cm. in its greatest dimension, there was a thrombosed vessel projecting into it. Stained sections reveal the presence of numerous acid fast bacilli in the tissues.

Postoperative course was not unusual. The temperature stayed around 102°F. on the first and second postoperative days, came down gradually and remained normal after the fourth day.

He is now symptom free and x-ray films of the chest (Fig. 2D) are clear. Bronchial lavage cultures are negative. He returned to work as a chauffeur at six months postoperative and is still on combined chemotherapy.

COMMENT

Conceivably, the surgeon will encounter the situation where he cannot distinguish which of two localized lesions is responsible for hemorrhage. If on either lung, it might be necessary to abandon the procedure at the preliminary bronchoscopy. If the lesions are in two lobes of the same lung, both lesions may be resected. Temporary occlusion of a lung segment with a soft clamp may be utilized.

Anesthesia should be so gauged as to provide minimum postoperative depression and narcosis and allow for the possibility of an error in the site of localization.
It seems probable that amounts of blood encountered during hemorrhage
would seldom if ever be too great to be taken care of by the anesthetist
with a tracheal tube in place, and the patient in position such as to promote
the gravity flow of blood out of the lung.

CONCLUSIONS

1. In a patient who will probably need resection surgery for well localized
lesions, the occurrence of severe pulmonary hemorrhage constitutes
a surgical emergency.
2. A responsibility of the attending physician in dealing with pulmonary
tuberculosis is to consider the surgical possibilities in case massive
hemorrhage occurs.
3. The increased risk of surgery during hemorrhage is small compared
to the dangers of sequellae in cases of severe hemorrhage in tuberculosis
patients.

RESUMEN

1. En un paciente que probablemente necesitará cirugía de resección por
lesiones bien localizadas, la presencia de hemorragia pulmonar-constituye
una emergencia quirúrgica.
2. Es responsabilidad del médico en tratándose de tuberculosis-pulmoo-
lar, considerar las posibilidades quirúrgicas en caso de que ocurra una
hemorragia masiva.
3. El aumento del riesgo de la cirugía durante las hemorragias es
pequeño, comparado con los peligros de las secuelas en casos de hemorragia
severa en pacientes tuberculosos.

RESUME

1. Chez un malade pour lequel il est probable qu’on sera amené à pra-
tiquer une exérèse pour des lésions bien localisées, une intervention d’ur-
gence peut être nécessitée par la survenue d’une grave hémorragie pul-
monaire.
2. Lorsque le médecin prend la responsabilité d’opérer après une phase
d’attente un tuberculeux pulmonaire, il doit prendre en considération les
possibilités chirurgicales si par hasard survient une grave hémorragie.
3. L’accroissement du risque chirurgical lorsqu’une hémorragie est en
cours est minime, si on le compare au danger des séquelles que peuvent
déterminer les hémorragies graves chez les tuberculeux.

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