Surgical Treatment of Multirresistant Lung Tuberculosis

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The medical treatment of tuberculosis with chemotherapy has a rate of failure near 2%, associated with drug resistance of first, second and third line regimens. In such cases, lung resection plays a significant role as an adjuvant method in treating it by resection of localized lesions, so it is possible to decrease the pool of bacilli and then improve the drug response. In a retrospective review of 139 patients with multiresistant pulmonary tuberculosis between 1980 and 1990, 32 cases were operated on. There were 17 men and 15 women all of them infected by mycobacterium tuberculosis resistant to Rifampin and Isoniazid. The resections performed were: pneumonectomy in 14 cases, lobectomy in 13 and segmentectomy in 5. The operative mortality was 6.2%. The postoperative follow-up to 18 months showed a negative sputum culture in 90% of the survivors and the others relapsed after the initial conversion. The results of this study show a high rate of conversion in patients with multiresistant tuberculosis treated with resective lung surgery.


Surgical treatment of lung tuberculosis is mainly indicated for sequelae and complications of this disease. Some of these complications such as massive hemoptysis or bronchopleural fistula associated to empyema may need to be treated as emergencies. (1,2,3). Mycobacterium tuberculosis infection cures in practically all of the patients, when treated with the appropriate drugs (4,5,6). Nevertheless, the appearance of bacilli resistant to drugs considered as the best antituberculous therapy leaves many patients with an uncontrollable disease (7,8,9). It is currently accepted that medical treatment of tuberculosis involves a 2 - 9% failure rate, due to multiresistance of the bacillus to drugs (10,11,12). Surgery for these patients seems to be very significant as adjuvant therapy (13,14). Selection of candidates which will undergo surgery and the type of procedure to be performed has been discussed in very few studies in the international literature. Centers with a greater experience apply criteria based on their own series, criteria which are not applicable to countries with different degrees of development. The problem lies in when to decide to perform surgery. There are no rules regarding this. The indication varies from an early operation in multiresistant patients (defined as resistant to Rifampin and Isoniazid) treated with very weak protocols, to very late operations when there are no useful drugs left and salvage surgery must be undertaken.

In addition to considering the pattern of resistance to drugs, the extension of pulmonary damage and functional capacity of those patients which are candidates for surgery must be assessed. Ideally, surgery should be undertaken with negative cultures with a time limit of three months previous to a specific preoperative treatment plan and in patients with predominantly localized lesions (15,16). We present 32 cases operated on in our institute in Santiago, Chile, which is specialized in respiratory diseases and thoracic surgery, to which practically all the multiresistant cases of our country are referred.

Material and Methods

We reviewed clinical charts from 1980 to 1990 period. One hundred and thirty nine patients were considered to be multiresistant, 23% of which underwent surgery. In this period of time, antituberculous treatment had already been standardized in our country (short) regimen therapy, seven months with four drugs (sm-inh-rif-pza). Selection criteria for surgery was based in our center’s prevailing experience; patients were selected when failure was suspected despite chemotherapy protocols used and when scarce control of disease expectations existed. Patients with localized cavitary lesions in whom resection would be compatible with adequate postoperative cardio-pulmonary capacity were preferred. The need for antimicrobial therapy postoperatively aimed for the control of the remaining bacilli populations. All patients received preoperatively the best drug according to the
sensitivity studies carried out during a period of 6 months in average. Twenty-nine cases with positive cultures were operated on. In only 3 cases, bacteriological negativity was found in sputum studies at surgery. Predominant unilateral disease was demonstrated roentgenographically, although in 7 bilateral lesions were present. In all cases, the most affected disease side was operated on. Preoperative workup included complete pulmonary function tests, arterial blood gases, CT scan of the chest in cases where there were doubts regarding the degree of parenchymal involvement, fibrobronchoscopy and quantitative perfusion/ventilation scans were performed in the functionally limited patients. The completed operations are described in Table 1. Since 1985, patients were routinely operated on with tracheobronchial intubation with double-lumen tubes. In all patients a posterolateral thoracotomy was performed. Muscular flaps were not used with the exception of the pediculated intercostal muscle, especially in pneumonectomies. The remaining bronchial stumps were protected with pleural flaps and pericardial fat pad. In upper lobectomies with lack of adequate expansion of the remaining lung and the presence of a larger pleural cavity thoracoplasty in two stages were occasionally carried out. Since 1985, the bronchial stump has been closed with staplers. Drug therapy according to sensitivity tests was continued postoperatively during 6 months on average. We have recently started an experience with latissimus dorsi and serratus muscular flaps for larger remaining cavities.

Results

Two patients died 30 days postoperatively. One of them, who underwent pneumonectomy, sustained a postoperative hemotorax. He was reoperated twice, developed a pleural empyema, bronchopleural fistula and sepsis. The second patient died in acute respiratory failure due to pulmonary thromboembolism. One patient died two years postoperatively. This patient who sustained bilateral disease had undergone pneumonectomy; converted and recurred twice. Death was a result of the relapse of his tuberculosis. The operative morbidity is shown below:

Postoperative complications n=52

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleural empyema</td>
<td>2</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>1</td>
</tr>
</tbody>
</table>

9.37%

The most serious complications were 2 pleural empyemas with peripheral fistulas which were managed with fenestration and later mioplasty and the second with prolonged pleural drainage. In both cases, there was residual parenchymal and incomplete fissures, which impaired healing and caused inadequate pulmonary expansion. Ninety percent of the operated cases presented negative sputum cultures for Koch’s bacilli during 18 months of follow-up. Three cases underwent initial conversion, recurring later (Table 2). These patients sustained bilateral disease and the most affected side was operated on: 2 underwent pneumonectomy, one of them died 2 years postoperatively.

Table 1 - Operations Performed n=52

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Segmentectomy</td>
<td>5</td>
</tr>
<tr>
<td>Lobectomy</td>
<td>13</td>
</tr>
<tr>
<td>Pneumonectomy</td>
<td>14</td>
</tr>
<tr>
<td>Thoracoplasty</td>
<td>1</td>
</tr>
<tr>
<td>Window thoracotomy</td>
<td>1</td>
</tr>
</tbody>
</table>

Discussion

According to the literature and to our experience, we believe that resection surgery in multiresistant tuberculosis brings about undoubted benefits for patients who medically are not amenable for healing. Morbimortality in well selected cases with current surgical techniques is low, and the healing percentages of the disease with long term follow-up reaches up to 90% (17,18,19). In our series, the 6.2% operative mortality increased to 9.7% due to one case that recurred, in which disease was not possible to control medically. This patient died 2 years postoperatively. The literature reports 22% mortality in resistant patients treated medically with specific drug protocols according to sensitivity studies. There are no comparative and randomized studies between alternate groups of patients, with medical treatment or medical-surgical treatment. Reasons are due to the difficulty of designing studies with comparable
groups due to the large amount of parameters pertaining to this pathology. Therefore, it is not possible to obtain consistent conclusions from these numbers (20, 21). The decision to operate on must take into account different elements such as extension of the disease, parenchymal polymicrobial contamination, positive sputum culture for Koch’s bacillus and the possibility of using useful drugs, pre and postoperatively. This must be assessed by the specialists, considering drug protocols which render best results in each case and the amount of time each treatment should be maintained for. A correct assessment of the general conditions of the patient and cardiorespiratory reserve is mandatory (22, 23).

Technically, partial pulmonary resection must be complemented eventually with the use of muscular flaps to reinforce healing of the bronchial stumps and the filling of residual cavities due to lack of expansion of the remaining lung (24, 25). Cases with contralateral lesions that require pneumonectomy should, according to these statements, remain without surgery. The majority of published series includes these type of patients which were operated on for being “desperate cases” (26, 27). In our experience, unfortunately the 2 patients who died underwent pneumonectomy and presented with contralateral disease. On the contrary, cases with localized bilateral lesions in upper lobes have been managed with deferred surgery obtaining good bacteriological results. Our impression is that from the epidemiological and medical management standpoint, the current situation of this pathology must give room for surgery as a valid therapeutic option for rescuing patients that otherwise would be condemned to incurability and isolation from the society.

References

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Tratamiento Quirúrgico para Tuberculosis Pulmonar Multiresistente

El tratamiento médico de la Tuberculosis pulmonar con quimioterapia tiene una tasa de falla cercana a 2%, ahora asociada a la resistencia a drogas de primera, segunda y tercera línea. En estos casos la cirugía ressectiva del pulmón tiene un rol importante como método adyuvante en el tratamiento de la tuberculosis, resecando lesiones localizadas. Solo así es posible disminuir el volumen de bacilos y con eso mejorar la respuesta de la terapia con drogas. En una revisión retrospectiva de 139 pacientes con tuberculosis pulmonar multiresistente, entre 1980 y 1990, 32 casos fueron operados, 17 hombres y 15 mujeres, todos infectados con Mycobacterium Tuberculosis resistente a Rifampicina e Isoniazida. Las resecciones realizadas fueron: neumonecctomía en 14 casos, lobectomía en 13 y segmentectomía en 5. La mortalidad operatoria fue de 6.25% en 30 días. El seguimiento post-operatorio fue en 18 meses y mostró culturas de esputo negativas en 90% de los pacientes vivos y los otros presentaron recidiva después de un periodo de conversión inicial. Los resultados de este estudio muestran un alto porcentaje de conversión en pacientes con Tuberculosis multiresistente sometidos a cirugía pulmonar ressectiva.