A New Method of Controlling Paradoxical Respiration in Single Stage Thoracoplasty

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Introduction

It is felt by the authors that there is still a distinct place for thoracoplasty in the treatment of pulmonary tuberculosis. We believe that attempts to treat every surgical case by resection will result in complications and deaths which could have been avoided by the occasional use of thoracoplasty. Furthermore, if a classical thoracoplasty could be done as described by Alexander,1 in a single stage, it would be less of a second choice than it is at present. It is not our aim to change the method of obtaining collapse. We have only added a simple maneuver which controls paradoxical respiration and permits three stages to be done in a single operation.

The major difficulty in accomplishing thoracoplasty in a single stage is the control of paradoxical motion of the chest wall after the removal of the ribs. The problem of blood loss, which previously supported the dictum of multiple stages, has been swept aside by the availability of adequate amounts of blood. We are not satisfied with plombage procedures or lesser degrees of the classical thoracoplasty to obtain a single stage thoracoplasty.2-7 For these reasons we have developed the following technique.

Method

A single stage thoracoplasty is accomplished, using a posterolateral thoracoplasty-type incision with removal of the third, second and first ribs entirely, including transverse processes. At this point, paradox becomes apparent and can be controlled by suturing as indicated in Figure 1. The suture material employed is #1 or #2 chromic catgut and an anchoring “bite” is taken of the sacrospinalis muscle. Subsequent superficial “bites” with the needle are taken of the intercostal muscles until the sternal origins of the pectoralis major are reached. Here a final anchoring “bite” is taken and the suture is tied. The fourth, fifth and sixth ribs, including transverse processes, are then taken in the customary fashion and one or two more sutures are taken as before. If the operator wishes, he may take out the seventh, eight and ninth ribs, including transverse processes, followed by one or two more sutures to obtain control of the paradoxical motion encountered following their removal. Replacement of blood loss, as indicated by sponge weighing techniques, is carried out simultaneously. The line of sutures may be employed in a direction parallel with the rib bed; however, it is easier and more effective to place them across the rib beds in a horizontal direction, as indicated in Figure 1. Control of paradoxical motion is sometimes more effectively controlled by tying all the ligatures after the desired number of ribs have been removed.

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Data

Our series is divided in two groups. The first group (23 cases) received a classical thoracoplasty of five to eight ribs with control of paradoxical respiration by the method outlined above. The indication for surgery was pulmonary tuberculosis with cavitary lesions which had failed to respond to anti-tuberculous drugs. All of the patients were poor risks and were not considered acceptable for resectional surgery. In this group, 16 of the 23 patients had far advanced disease and 15 had bilateral disease evident at the time of operation. Seven of the patients had had interrupted courses of chemotherapy prior to surgery. One patient expired on the sixth postoperative day from a massive pulmonary hemoptysis. Autopsy was denied. One had a reactivation one month postoperatively and later required a resection for removal of his lesion.

Of the remaining patients, no complication was encountered. Our longest follow-up is four years. The sputum or gastric washings are negative in all but one (21 cases). In these cases we do not believe we could have done as well if we had employed resections.

The second group consisted of an additional 12 patients with non-tuberculous disease who required thoracoplasty for varying reasons. From four to 11 ribs were removed in one stage in these cases without complications or evidence of paradoxical respiration.

Discussion

We have found that we can obtain a more efficient collapse by single stage thoracoplasty than when multiple stages are employed. The single stage procedure has been well tolerated. We fully expected that resection in many of these cases would be necessary, but to date only one has been necessary for thoracoplasty failure.

Our experience in controlling paradox by the above method has been satisfactory. We are not advocating return to thoracoplasty as the prime treatment for cavitary
tuberculosis, but we feel that a surgeon who will not do an occasional thoracoplasty will be forced to deprive a few patients of the benefits of surgery.

The surgical maneuver to control paradoxical respiration consists of properly placed sutures and is quickly and easily done.

SUMMARY

There is still a distinct place for the use of thoracoplasty in the treatment of tuberculosis and the occasional use of thoracoplasty in the poor risk type of patient can be very effective when supplemented by adequate anti-tuberculosis drugs. The method described is that of a classical thoracoplasty initiated by Alexander, and done in a single stage. Control of paradoxical respiration is easily accomplished by placing anchoring sutures from the sacrospinalis muscle to the pectoralis major, as indicated in Figure. From four to 11 ribs have been removed, including the transverse processes in 35 patients, with one death. The results of the surgery have been gratifying.

RESUMEN

Hay aún un lugar definido para el uso de la toracoplastia en el tratamiento de la tuberculosis y el uso ocasional en el enfermo que constituye un mal riesgo puede ser muy efectivo cuando se proporcionan las drogas antituberculosas convenientes. El método descrito es el de la toracoplastia clásica iniciada por Alexander y realizada en un solo tiempo. El control de la respiración paradojica es fácil de realizar colocando suturas de fijación desde el sacrospinal hasta el pectoral mayor según se indica en la Figura 1. Se han resecado de 4 a 11 costillas incluyendo las apófisis transversas en 35 personas con una defunción.

Los resultados de la cirugía han sido satisfactorios.

RESUMÉ

Il existe encore une place précise pour l'utilisation de la thoracoplastie dans le traitement de la tuberculose et son emploi éventuel chez les malades à qui on ne peut faire courir que de petits risques, peut être efficace lorsqu'elle est complétée par les prescriptions antituberculeuses convenables. La méthode décrite est la thoracoplastie classique d'Alexander, pratiquée en un seul temps. Il est facile d'empêcher la respiration paradoxale en sutureant le muscle spinal au grand pectoral, comme indiqué dans la Figure 1. De quatre à onze côtes ont été enlevées, avec les transverses chez 35 malades. Il y eut un seul décès. Les résultats de l'opération sont encourageants.

ZUSAMMENFASSUNG


Die Ergebnisse der chirurgischen Therapie waren befriedigend.

REFERENCES