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Bilateral Thoracoplasty: An Experimental Study upon the Dog and the Monkey.*

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In order to determine experimentally any possible ill effects which might follow the use of bilateral upper extrapleural paravertebral thoracoplasty in the treatment of bilateral chronic apical pulmonary tuberculosis, the procedure was carried out on a series of dogs and on a monkey before attempting it on the human. All operative procedures were patterned as nearly as possible after the Wilms-Sauerbruch and Brauer technique as applied to man. The approach in dogs was made through a curved incision posterior to the scapula separating the fibres of the latissimus dorsi without cutting them and sectioning the tendon of insertion of the rhomboids at its attachment to the scapula, being careful to avoid interrupting the nerve supply of any of the structures. The technique employed in the monkey was almost identical with that used in man. A multiple stage subperiosteal costectomy of the paravertebral type was employed in all. The mortality encountered in the series was apparently in no way related to the bilateral collapse itself.

Both a symmetrical and asymmetrical type of bilateral thoracoplasty were performed upon the dogs. Dog No. 7, a small German Shepherd, illustrates the symmetrical type of collapse in which approximately 50% of the total length of the right upper 7 ribs and of the left upper 6 ribs were resected posteriorly. The asymmetrical group is represented by surviving dog No. 4, a Great Dane, in which approximately 35% of the total rib length of the right upper 9 ribs and the left upper 4 ribs was resected in the paravertebral region. Subsequent regeneration of these ribs produced a fixation of the upper chest in the collapsed position. At the present time these animals show no gross deformity, no interference with their normal activity, no respiratory embarrassment even under moderate exercise and no spinal curvature.

A single specimen of small monkey (Rhesus) was then operated upon in order to observe any spinal changes which might occur with bilateral collapse as a result of erect posture. Large segments of the right upper 6 and the left upper 4 ribs were removed, the total

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lengths being 25% of the amount which would be removed in man in the typical Wilms-Sauerbruch operation. Here also no gross deformity, respiratory embarrassment and no spinal deformity was noticed. The animal seems to be as active as its fellows. The amount of collapse on all of these animals will be made more extensive at a later date.

From the above observations upon animals, we may judge that bilateral upper paravertebral thoracoplasty, where indicated, may be undertaken without fear of gross deformity, of respiratory embarrassment due either to the extent of the collapse itself or to the fixation of the chest wall by regeneration of the ribs, or of spinal curvature resulting from either the symmetrical or asymmetrical multiple rib resection.