

ning of surgical relaxation before insufflation is instituted. The second error is to pass the tubes into the beginning of the esophagus. The tubes should never be passed further than the following measurements: Mark off on the catheter the distance from the ala of the nose to the corresponding auditory meatus of that individual and insert the catheter only to that measurement which will carry it in behind the epiglottis but not into the grip of the esophagus. On the other hand, if the tubes be not passed into the lower pharynx, the air supplied is not freely available for inspiration.

For a few minutes after the introduction of the tubes it is well to hold the mouth closed and the jaw forward as one does with a face-inhaler. Soon, however, the stertor of the usual anesthesia quiets to a natural unobstructed respiration, and the jaw and mouth can be neglected. Usually, in fact, so smooth is the delivery and quiet the sleep that it would be perfectly feasible with this, as with the intratracheal method, for the operator to adjust the tubes and the air-ether delivery, and then proceed with the surgical operation without the presence of any anesthetist, as one does by insufflation on the animal in the laboratory of surgical research.

Patients take the same percentage of ether whether the ether is delivered copiously by the intrapharyngeal method, or by the intratracheal method. This percentage has proved remarkably constant on the average. A patient having first been placed under primary anesthesia to the stage of abolition of the pharyngeal reflex by a closed or open face-inhaler, the usual percentage by weight of ether necessary to maintain by insufflation, light, even, surgical anesthesia has proved for the first five minutes of surgical anesthesia to be 18 per cent.; for the next twenty-five minutes, 14 per cent.; throughout the second half-hour, 12 per cent.; through the second hour, from 12 to 8 per cent. Alcoholics, athletic fat persons, thick-set negroes, certain patients at puberty, athletic young adults between 18 and 26 years of age, and patients requiring operative manipulation in the upper abdomen average 4 per cent. higher than this throughout the first half-hour, children and relaxed women run about 2 per cent. lower. Of course the quantity must meet the entire demand of inspiration, without dilution by outside air, for these figures to hold true.

In the average adult about 960 liters (a thousand quarts) of air and about 165 gm. ($5\frac{1}{2}$ ounces) of ether are delivered in the first hour of surgical anesthesia. Of the total vapor less than half is utilized to maintain a constant intrapulmonary ether percentage by being inspired; the rest is wasted through the expiratory and apneic period, doing work only to clear the upper air-passage. Rebreathing is not contemplated or countenanced in this method.

The air-supply at Roosevelt Hospital is from an efficient permanent equipment.¹ As a portable source, a foot-bellows with gas-reservoir is fairly satisfactory, as is a small motor-driven rotary blower.

Fuller details of pharyngeal insufflation, as applied to ether and to nitrous oxid-oxygen will be published soon, with tables of ether percentage required by man.

I wish to express my indebtedness to Drs. Charles H. Peck and Charles N. Dowd, on whose services at Roosevelt Hospital the methods herein described have been developed, and the ether-air requirements observed on a total of about 350 cases of intratracheal insufflation anesthesia and 250 cases of the intrapharyngeal type.

63 West Forty-Ninth Street.

1. Described in the International Hospital Record, November, 1912.

PERINEORRHAPHY WITH THE FIGURE-OF-EIGHT SUTURE

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The following method of suturing in cases of perineoplasty may not be original, though I have never seen it

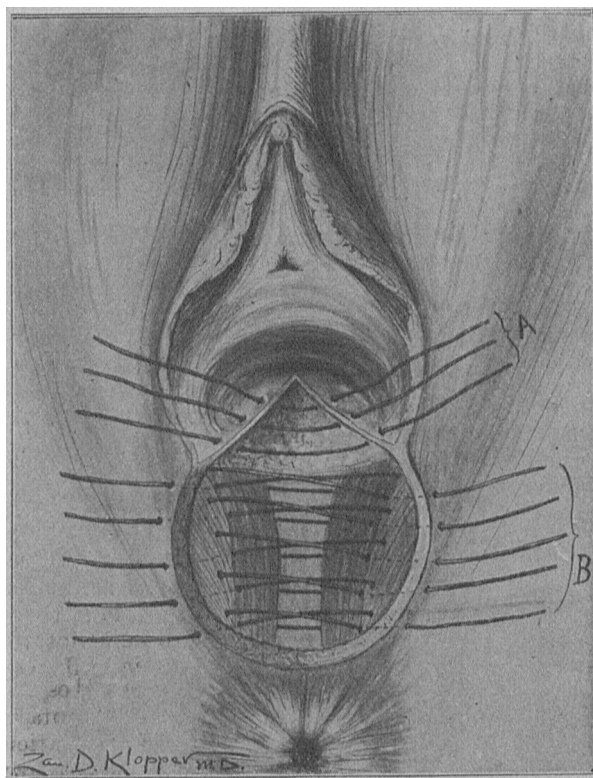


Fig. 1.—The figure-of-eight sutures at B unite the levator ani and perineus transversus muscles as well as the skin. The sutures at A approximate the cut edges of the vagina.

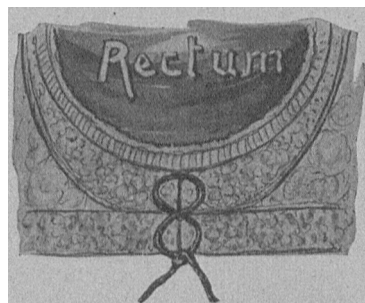


Fig. 2.—Transverse section of perineum showing how the inner (upper) loop of the figure-eight suture unites the anal muscles, and the outer (lower) loop unites the transverse perineus muscles and skin. The knot is on the skin surface.

described. If, however, it is not new I feel that I need hardly make further apology for re-presenting so valuable a bit of operative technic.

In a thorough trial on all classes of cases I have found the results uniformly so much better than with the older methods that it seems to me a distinct advance.

The choice of a suture material for use in cases of perineal repair is of some moment, and second in importance only to the method of introducing the sutures. I have long since discarded absorbable material such as catgut and kangaroo-tendon on account of the uncertainty of absorption, varying tensile strength and low power of resistance to infection. Of the non-absorbable materials the so-called silkworm-gut, because of its uniform strength and pliability, makes the ideal

suture for this work. The extra large strands should be used and preferably those that have been dyed. They should be well softened in water before use.

METHOD OF INTRODUCTION

The vaginal sutures are passed and tied in the usual manner. In the perineum a figure-of-eight suture is used, the first bite of which catches up the levator ani muscles, and the second bite the transverse perineus muscles and skin. Care should be taken in tying these sutures not to bring them too tightly together, or they will cut deeply into the tissues and be difficult to remove. The tissues included within their grasp are to be just snugly approximated—no more.

The ends are left long and all sutures are removed on the tenth day.

ADVANTAGES

1. High percentage of primary union.
2. Perfect approximation with the obliteration of all "dead" space.
3. Fewer sutures with a consequent minimization of interference with nutrition to the tissues.
4. No buried sutures of uncertain strength and questionable sterility, with a low power of resistance to infection and an uncertain period of absorbability, but removable sutures of unquestionable strength, non-absorbable, non-infectible and absolutely sterilizable.

163 East Seventy-First Street.

THE CONGENITAL ABSENCE OF RIBS

REPORT OF A CASE WITH COMPLETE ABSENCE OF THE LEFT SEVENTH AND EIGHTH RIBS*

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The congenital absence of ribs seems to be a rare condition. Supernumerary ribs, especially in the cervical region and less frequently in the lumbar region, are more often seen. Bicipital ribs are occasionally found and usually occur at the first rib.

The congenital arrest in the development of the ribs is more frequent than the arrest of formation or the complete absence of the ribs. The arrest of development is generally manifested at the costal cartilages and the anterior parts of the ribs. It does not occur at any constant level. The defect is generally unilateral, and the first rib is usually unaffected.

As a rule defects of the ribs do not occur alone. There is usually some corresponding failure of development in the vertebral column. The scapula, the muscles of the thoracic wall, and the pleura are also frequently involved. Scoliosis is often present. These patients are generally born with a straight spinal column, but later it becomes bent by muscular action, early in life or at the time when the patient begins to walk. Usually some axial rotation develops in the vertebral column, as well as compensatory curves in the lumbar and cervical regions. Pulmonary hernia may be present.

After a careful search of the literature I am able to mention nine cases showing the complete absence of one or more ribs. The titles of many articles are misleading. They imply that there is a complete absence, when only a defect of a rib is present. Few of these cases were subjected to an x-ray or post-mortem examination,

so it is possible that non-palpable rudiments of ribs may have been present in some of them.

Packard¹ reports a case of a woman aged 39, with eleven ribs on each side. The post-mortem examination by Dr. S. W. Mitchell showed that the left fourth rib was broadened anteriorly and was united to the sternum by a broad cartilage, which was perforated by a round hole so as to indicate its normal double state. On the right side the fourth rib was broadened at the anterior end.

Gripat² describes an acephalic monster with nine ribs on the right side and seven on the left. On the right side the first rib was attached to the middle of the second rib by a ligament. The second and third ribs were united behind at the vertebral column, but were separated in front and attached to the sternum. The fourth and fifth ribs were formed in the same manner as the second and third. The sixth, seventh, eighth and ninth ribs were free anteriorly, but articulated normally with the vertebral column posteriorly. On the left side the first, second and third ribs were united posteriorly, and this common osseous structure was traversed by holes for the nerves. The fourth rib was twice the width of any of the others. The fifth, sixth and seventh ribs were separated and had no anterior attachments.

Gage³ mentions a girl aged 17, with five ribs absent on the left side. The first, second, third, fourth and fifth left ribs were normal. The sixth rib was represented anteriorly by its costal cartilage which joined the fifth rib. No trace could be found of the left seventh, eighth, ninth and tenth ribs. The eleventh and twelfth ribs were normal. There were twelve dorsal vertebrae. There was no curvature of the spinal column at birth; but a scoliosis in the middorsal region, with the convexity toward the normal right side, developed about the fifth year. There was a compensatory curve in the lumbar region. The angles of the ribs were prominent on the right side, due to a marked horizontal rotation of the vertebral column. There were no other such cases in the family.

Gage³ also mentions a case which was reported by Willet and Walsham to the Royal Medical and Chirurgical Society (in 1880). There were only five ribs on the right side and four on the left, and four and one-half dorsal vertebrae were absent. There was a lateral curvature of the spine with the convexity to the left, which they believed to be due to the absence of the right half of the third dorsal vertebra.

Sabrazès⁴ reports the case of a girl aged 2, in whom the sixth and part of the seventh ribs were absent. The left first, second, third, fourth and fifth ribs were normal. The sixth rib was absent. The seventh rib was represented by a broad cartilage anteriorly. The eighth rib was composed of two bony rods side by side, which were fused together posteriorly. The cartilage joining these rods to the sternum anteriorly showed traces of being divided. The ninth rib was bound in front to the eighth by a thick cartilage. The tenth, eleventh and twelfth ribs were floating.

Murray⁵ describes a patient aged 5, with complete absence of the eighth, ninth and tenth ribs on the left side. The left eleventh rib was smaller than the corresponding right rib, while the left twelfth rib was longer and larger than the right twelfth rib. The defect in

1. Packard: Proc. Path. Soc., Philadelphia, 1867, II, 121.
2. Gripat: Bull. Soc. anat. de Paris, 1872.
3. Gage: New York Med. Jour., 1889, I, 650.
4. Sabrazès: Rev. de méd., 1894.
5. Murray: Tr. Clin. Soc. London, 1806, xxix, 252.

* Read before the St. Louis Medical Society, Oct. 19, 1912.
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