if more cases of pulmonary tuberculosis were diagnosed while they are still Group I patients (that is, with only 4.8 per cent. showing laryngeal lesions) instead of Group III (that is, with 31.5 per cent. with the larynx involved). More cures could be effected if every case of persistent huskiness or throat discomfort were earlier submitted to a skilled examination.

PRINCIPLES OF SUCCESS IN TREATMENT.

It is manifest that a patient has a more sure hope of a quicker cure inside a well conducted sanatorium than he can expect otherwise. Even if he remains in a sanatorium only long enough to learn how to manage himself, this sojourn is highly beneficial. This is shown by the number of my cases which left Midhurst with the larynx still diseased but who kept up sanatorium principles and later on obtained complete and lasting cicatrization of their throat trouble.

The chief local requirement is voice rest, which can be so easily carried out in a sanatorium but is elsewhere so difficult. Out of 119 cases which were cured, the healing was obtained without other local treatment than voice rest (whispers or silence) in no fewer than 73 instances. That such a simple treatment—though long and arduous for the patient—can be so effective should encourage perseverance with it when indicated.

Local surgical methods of cure have all been abandoned by me as useless and frequently harmful. My statistics show that a laryngeal lesion generally indicates an extensive lung lesion, or a very virulent infection, or lowered resistance. As things are at present, the majority of patients with laryngeal tuberculosis soon die (70.5 per cent.); they generally die of their lung disease. Topical surgical measures in the larynx are only apt to hasten this; their successful local results have never been frequent or enduring; and we have, in the galvano-cautery, a safer and more certain help. The galvano-cautery has, in my practice, superseded all other topical measures—curetting, injections, insufflations, application of lactic acid or other caustics. I have never seen a single case in which it has done harm, although in some it has been abandoned as useless. It effected a cure in 46 out of 74 cases in which it was tried (=62.1 per cent.). Of these 46 cures, 29 are alive and well; 12 of them have now maintained their cure for ten years. The galvano-cautery is the best local treatment we have at present. In suitable cases it has replaced all other methods.

CONCLUSIONS.

The majority of cases of tuberculosis of the larynx do not recover. It is necessary for the physician to recognize this, to try and determine which cases come within this category, and to act accordingly. But these 119 cures are witnesses of the more hopeful outlook we now have for a fair proportion of patients of whom an authority has said that, forty-five years ago, "all were doomed to die; the appearance of the disease in the larynx was the warrant of death."⁴

The pessimistic past has now a more optimistic outlook. As the Minister of Health said lately on a public occasion: "The fight against tuberculosis was a long one, but it was a winning one."⁵ At the recent Congress on Tuberculosis in Lausanne (August, 1924) it was shown by Sir Robert Philip that this fight is being won, not simply by the population becoming immunized or by such general advances as improved national health and hygiene, but by the measures of direct attack originated and inspired by our profession.⁶

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CERVICAL RIBS IN CHILDREN.

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EVER since Sir William Thorburn¹ in 1905 showed that certain symptoms in the upper limb were associated with the presence of cervical ribs, an increasing number of reports upon this condition have appeared in medical literature. Supernumerary ribs have been recorded in both sexes and at all ages. Thorburn states that the earliest age he has met with them was the seventeenth year. Sir William Turner² refers to a case described by Rosenmüller in an embryo of six months, and Stiles³ has also recorded a case in a female infant of 18 months. Nevertheless, comparatively little attention has been directed to the presence of cervical ribs as a possible cause of symptoms in children, and this paucity of data is all the more striking when one considers the increasing use of radiography at the present time. It is undoubtedly true that in the majority of cases the symptoms produced by cervical ribs do not appear until adult life is reached, and that in young children attention is perhaps only drawn to their presence by a prominence in the neck or by the accidental discovery of the condition in a radiograph of the neck.

The four cases of cervical ribs in children described in this paper have recently come under our observation and have led us to make further investigation into the frequency of their occurrence. The result has been to convince us that this condition has not received the consideration which it deserves.

The first of the four cases occurred in a girl 4 years of age, and although the ribs were causing no pressure symptoms, the child was brought to the Royal Manchester Children's Hospital early this year on account of two hard masses above the clavicle. The swellings were very prominent and extended from the spine to the first dorsal ribs. Radiological examination showed that bilateral cervical ribs were present. In the absence of any symptoms no treatment has been deemed necessary up to the present time.

In the second case, however, the pressure effects were so definite that operative treatment was clearly indicated. The case is worthy of detailed record, as it is unusual to find such typical symptoms at so early an age.

M. G., a girl aged 12 years, was brought to the Manchester Northern Hospital in June, 1923, complaining of neuralgic pain in the left forearm and hand, and a constant irritating cough. She was first seen by Dr. Mather, who was unable to find any clinical signs in the chest to account for the cough, but discovered a swelling in the left side of the neck. He referred the child to one of us for further investigation and treatment as being a case of suspected cervical rib. Examination revealed a hard bony tumour above the left clavicle, with some atrophy of the intrinsic muscles of the left hand. Pain was complained of along the ulnar border of the forearm and hand, but no circulatory or trophic disturbances were present. A radiogram demonstrated the presence of a large cervical rib on the left side arising from the seventh cervical vertebra. Operation for its removal was advised, and this we carried out shortly afterwards. A flap was made along the upper border of the clavicle and behind the sterno-mastoid muscle, the brachial plexus being then exposed. The plexus was seen crossing the cervical rib, the inner trunk lying directly on the bone. The rib was cleared in front and disarticulated through its juncture with the first dorsal rib, finally being divided behind with bone-cutting pliers as far back as possible. During its removal the pleura was damaged, but no trouble resulted from its injury.

Bleeding points were secured and the wound closed, firm pressure being applied with a pad and bandage. Recovery has been satisfactory, the wasting has now practically disappeared with massage, and there is no longer any pain.

The portion of the rib removed measured $1\frac{1}{2}$ inches in length. The anterior extremity ended in a joint with an articular cartilage and synovial membrane which joined it to the first rib. The attachments for the scalene muscles were clearly seen after its removal.

In the third case, also a girl aged 12 years, there was a pair of cervical ribs causing distinct swellings on either side of the neck; there were no pressure symptoms in this patient requiring treatment.

The fourth case was also found in a girl; here symptoms made their appearance at the age of 15. A right cervical rib was subsequently removed on account of the pain in the arm and the wasting of the small muscles in the hand, with fairly satisfactory results.

This succession of cases in the course of a few months suggested to us that it would be of interest to examine the records of the x-ray department of the Royal Manchester Children's Hospital. On doing so we discovered that in the last two thousand x-ray examinations, including all parts of the body, in no less than nine cases were cervical ribs reported to be present. The details of these cases are as follows:

No.	Sex.	Age.	Clinical Diagnosis or Symptoms.
1	F.	12 years 3 months	Cervical ribs.
2	F.	4 " 5 "	Cervical caries.
3	F.	10 " 11 "	Torticollis.
4	M.	9 " 7 "	Cervical caries.
5	M.	2 " 1 "	? Cervical caries—? trauma.
6	F.	12 " 10 "	Cervical ribs, paresis of left arm.
7	M.	5 "	Torticollis—? cervical caries.
8	F.	4 "	Cervical ribs.
9	F.	7 " 7 "	Torticollis—? cervical caries.

It is interesting to note that the disturbances due to the presence of cervical ribs gave rise to the clinical diagnosis of cervical caries in five cases, whilst in three instances their presence was associated with spasmodic torticollis. In many instances the differential diagnosis can only be made by means of radiography, and in most of these cases the presence of cervical ribs could not be definitely established on palpation, even after their demonstration by x rays.

The incidence of such a large number of cases in the course of fifteen months has convinced us that the occurrence of cervical ribs is more frequent in childhood than is generally supposed to be the case, and that we are well advised in drawing attention to the condition.

Most radiologists will, we think, agree that cervical ribs are less frequently detected in children than adults. Although the records of the Royal Manchester Children's Hospital show a comparatively large number of cases in a short period, we are inclined to think this is a somewhat unusual occurrence.

With regard to the relative frequency with which cervical ribs are found, there are no definite data available. Fischel of Prague¹ reports that in routine necropsy examinations over a period of four years the condition was found in 1 per cent. of all bodies examined. From the x-ray appearances observed in our group it appears that in the majority of cases cervical ribs are only partially ossified at birth and are not revealed by x rays until later in life. In one of our cases where well marked cervical ribs were palpable a radiograph showed that only a small portion of the rib was ossified. The dorsal ribs are ossified at birth, but at puberty secondary centres appear, and ossification and growth are not completed until about the twenty-fifth year. It is probable, therefore, that the ossification of a more or less

rudimentary rib may be still further delayed, and this is suggested in our series of radiographs. We have seldom met with really large cervical ribs in children demonstrable by x rays, and this supports the view that their growth and ossification are not complete till later life, when the incidence of cervical ribs appears to be more frequently recognized. With the growth of the child the dorsal ribs increase in size and length, and cervical ribs will no doubt do likewise.

The fact that the onset of symptoms in these cases is usually delayed until after adolescence is accounted for by Todd² as being due to the descent of the shoulder-girdle, which is not complete till the third decade of life. An additional factor in causing dropping of the shoulder-girdle has been suggested by Stopford³—namely, weakness of the supporting muscles, producing stretching of the nerve trunks over the rib. We suggest, as a further explanation why symptoms are delayed till adult life is reached, the fact that ossification is not complete till after adolescence. It is natural to suppose that the increase in growth and size of the rib may lead to greater pressure on the nerve trunks, resulting in the nervous disturbances encountered in these cases. It is interesting to note in this respect that in our cases the pressure effects were most marked in those children possessing more completely ossified and therefore larger ribs. On the other hand, it is undoubtedly true that in adults severe symptoms are sometimes caused by comparatively small ribs, and that even a large pair of cervical ribs may produce no ill effects of any kind.

Cervical ribs are, for some unknown reason, found to be more frequent in women than men, and this is also borne out in our series, where ten out of thirteen cases occurred in the female sex. They are said to be bilateral in about 80 per cent. of cases, and in the group under review were bilateral in all except one case.

In many cases of cervical ribs no treatment will be found necessary. Where, however, symptoms are present a short course of non-operative treatment to promote development of the muscles supporting the shoulder-girdle should be tried. Should, however, no improvement result after two or three weeks, surgical treatment consisting in removal of the rib is indicated. When there is marked atrophy of the muscles of the hand their recovery is rarely complete, and this should be an additional reason for avoiding unnecessary delay. Where operation is undertaken before there is serious damage to the nerves it usually results in rapid subsidence of the disturbances.

Our thanks are due to Professor Stopford for valuable assistance and advice in the preparation of this paper.

Conclusions.

1. Cervical ribs are congenital abnormalities and may be found in children at all ages.
2. In thirteen recorded cases twelve were bilateral and ten occurred in girls.
3. Their diagnosis will frequently only be made after radiographic examination.
4. In the majority of cases symptoms do not appear till adult life is reached.
5. The delay in the onset of symptoms may be due to the ossification of the rib, which is not complete till about the twenty-fifth year.
6. In young children, however, they occasionally give rise to very definite symptoms in the upper limb similar to those seen in adults.
7. In others their presence may lead to a diagnosis of spinal caries or torticollis, and the differential diagnosis can be established only by radiography.
8. Only rarely will treatment by operation be considered necessary.

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