THE SIGN OF THE CLAVICLE

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In two recent papers Higouménakis (1930, 1937) has called attention to an enlargement of the sternal end of one clavicle in congenital syphilis, and he considers that its presence is a valuable aid in the recognition of this disease. He explains the development of this enlargement as a hyperostosis resulting from an osteitis in which three factors are concerned.

1. *Anatomical*.—The clavicle has a different mode of development from the other long bones, the shaft being ossified by the fusion of two centres which appear in connective tissue without an intermediate cartilaginous stage. This fused centre in the shaft is laid down early in foetal life, but the secondary centre at the sternal end does not appear until the eighteenth or twentieth year, joining the shaft at the twenty-fifth.

2. *Biological*.—The *Spirochaeta pallida* has a predilection for connective tissue, and it would thus be expected to settle in this bone, in much the same way as it chooses the membranous bones.

3. *Mechanical*.—The continual strain to which the inner end of the clavicle is subjected by movements of the arm tends to give a unilateral distribution to the lesion, corresponding to the right- or left-handedness of the individual.

Higouménakis defines the lesion as an increase in volume of the sternal end of the clavicle, particularly of the inner third. He found the sign to be present in more than 85 per cent. of the 197 cases which he had collected up to 1930. In his more recent paper he gives an account of another twenty patients and mentions a further seven shown at the Society of Medicine of Athens in 1930 and 1931; in all of these the lesion was present. He quotes five observers who have shown nine other cases in Athens and in Cairo. Dorne and Zakon (1935) also found the sign in each of twelve undoubted cases of congenital syphilis. Touraine *et al.* (1932, 1933) described a case with an enlarged clavicle as a localized form of von Recklinghausen's disease of bone, but later, as the result of a biopsy, they gave evidence that long-standing syphilitic changes were present in the enlarged portion. In consequence of his own clinical experience and of these confirmatory observations Higouménakis states that the sign has a diagnostic value equal to the cardinal signs of congenital syphilis. Its frequency, he says, is greater than the other certain stigmata of the disease, hence its diagnostic value; furthermore, it is never found in the subjects of acquired syphilis or in the normal.

Stokes (1934), on the other hand, quotes the investigation of a series of 202 cases of late congenital syphilis at the Mayo Clinic in which the clavicle was found to be enlarged in only 4 per cent. of the patients. It would appear that he considers the sign to be a useful adjunct in the diagnosis of congenital syphilis, but he classes it as "a secondary landmark," by itself insufficient for diagnosis. He remarks that, while clavicular enlargement is not common, it is often overlooked, and that, when present, gross thickening of the inner end of the clavicle with roughening and irregularity should be checked by x-ray examination. Moreover, he lays stress upon the examination of the shoulder girdle in acquired syphilis,

adding that enlargement of the sterno-clavicular articulation has been recognized in this condition for years past. Thus, of 239 cases with late bone and joint lesions in acquired syphilis seen at the Mayo Clinic, 7.5 per cent. showed clavicular enlargement. In their twelve cases of congenital syphilis, Dorne and Zakon (1935) refer to the enlargement as being of the sterno-clavicular articulation, though Higouménakis denies this on radiological grounds. Stafford McLean (1931), writing on the x-ray appearances of the bones in congenital syphilis in children, states that, although the examination of the clavicle was not a routine, an enlargement of the body was found in a number of cases.

The Present Investigation

Nearly 2,000 of the patients in this hospital are mental defectives. Among them there were sixty-four cases of congenital syphilis, and these have been re-examined to ascertain the incidence of clavicular abnormality. As controls, the clavicles of 1,200 non-syphilitic patients have been examined. It must be observed that palpation gives more information as to size and shape than a single x-ray film, and misleading results may be obtained by reliance on inspection and photography, which for their success depend partly on the absence of subcutaneous fat. Furthermore, since there appear to be variations in the form of the clavicular enlargement the sign has not been found simple to elicit. From an analysis of our material we have been able to differentiate five types of abnormality, of which two or more may be found in the same patient: (1) a generalized enlargement of the sternal end; (2) an exostosis projecting from the inner end of the bone; (3) a roughening of the inner third; (4) a thickening of the posterior surface of the outer third or an enlargement of the middle of the bone; (5) a tubercle at the point of origin of the clavicular head of the sterno-mastoid muscle. If any of the first three abnormalities were present to a marked degree in a case of congenital syphilis we have classed this as a positive result. Minor deformities we have found to be so common, even among normal people, that no account is taken of them in our results.

Of the sixty-four patients, twenty-nine are females and thirty-five males, their ages ranging from 18 to 73 years. Fifty-six have had positive serological reactions within the last seven years; their chances of having acquired syphilis can be eliminated either by their length of stay in institutions or by the presence of unequivocal stigmata. The following table shows the clinical evidence on which the diagnosis of congenital syphilis was made in the eight cases with negative serological findings.

Age and Sex	Facies	Inter-stitial Keratitis, Choroido-retinitis, or Iritis	Hutchinson's or Moon's Teeth	Osteo-peri-ostitis	8th Nerve Deaf-ness	Rha-gades	Family History
35, F.	+	+	Edentulous	+	+	+	—
42, F.	+	+	"	+	+	—	+
38, F.	+	—	"	+	—	—	+
50, F.	+	+	—	—	—	+	+
35, F.	—	+	+	+	+	+	Not known
26, M.	—	+	—	—	+	—	
36, M.	—	+	+	+	—	—	—
37, M.	+	+	+	+	—	+	—

Of the sixty-four cases of congenital syphilis, nineteen (ten males and nine females) show gross abnormality of

the inner ends of their clavicles, in the form of general enlargement, exostoses, or roughening. The 1,200 controls represented examples of all degrees of mental defect. Thirty-nine of the 600 males and twenty-six of the 600 females examined have marked clavicular enlargement similar to that observed in the cases of congenital syphilis. No obvious relation between the hand used and the enlarged clavicle was found to exist in either the patients with congenital syphilis or the control group—in fact, in the small majority of cases the larger clavicle was on the left side, though most used their right hands by preference. We were unable to find a single case of congenital syphilis with a gross enlargement on the one side that was not accompanied by some degree of deformity on the other.

Results

Possible explanations for the difference in our results from those recorded by Higouménakis and others are:

1. The sign may be produced in its fully developed form only when the patient has performed a considerable amount of manual labour. If this is so, one would not expect to find clavicular enlargement in other than a very small percentage of our cases, the majority of whom are incapable of sustained work.

2. All the controls with enlargements might be unrecognized cases of congenital syphilis without other stigmata or positive serological reactions. This does not seem to be remotely possible; even if it were, the bilateral distribution of the lesions would still demand explanation.

3. The enlargements we have found may be of a different type from those described by Higouménakis, in which case the sign would obviously have little value as a stigma of congenital syphilis. On the other hand, if the lesion we have seen in nineteen of our cases of congenital syphilis is identical with that described by Higouménakis, its distribution is certainly not unilateral, and since it can occur in normal controls it cannot be accepted as reliable evidence of congenital syphilis.

Lesné and Boutelier (1931), in discussing the relation of syphilis to the bony changes of rickets, quote Cannuta's figures: of 1,285 cases of rickets 37 per cent. showed definite evidence of congenital syphilis. From this it would appear that the two diseases are often associated, and we think it not improbable that the tubercles observed at the points of origin of the clavicular heads of the sterno-mastoids may be rachitic in origin. By far the largest tubercles we have seen were in a rickety dwarf. The tubercles were found about as often as the clavicular enlargement both in the cases of congenital syphilis and in the controls. These two abnormalities were associated frequently enough to suggest a common factor in their production, which seemed more likely to be rachitic than syphilitic.

The remaining two types of deformity noted in our series were found to be so uncommon as hardly to merit description, but a brief reference to two examples may be of some interest. A juvenile general paretic aged 26 shows a regular spindle-shaped enlargement of the middle of each clavicle with normal sternal and acromial extremities. A congenital syphilitic female aged 35, with cranial bossing, tibial thickening, and large exostoses of the sternal ends, exhibits a marked thickening of the posterior borders of the outer thirds of both clavicles; this thickening was also observed to a lesser degree in two other cases of congenital syphilis.

Summary

Higouménakis has claimed that "the sign of the clavicle" is one of the most certain and common stigmata

of congenital syphilis. We have examined sixty-four patients with the disease and found enlargement of the sternal ends of the clavicles in nineteen (29.7 per cent.). Among 1,200 non-syphilitic controls similar lesions were found in sixty-five (5.4 per cent.).

We have not been able to show a relation between the degree of clavicular enlargement and the right- or left-handedness of the patient. In our cases the lesions were never strictly unilateral.

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BRONCHOGRAPHY WITHOUT COCAINE

BY

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The introduction of lipiodol, neo-hyōriol, or other radio-opaque oil into the bronchial tree as an aid to radiological investigation of certain diseases of the chest is becoming a more and more frequent procedure. Varying methods employed are capable of giving satisfactory results in practised hands. None the less, the degree of discomfort the patient may experience varies with each method, and it is for this reason that certain modifications of technique are to be preferred.

Usual Methods

When a gum-elastic catheter is inserted by the nasal route it is necessary first to spray the nose and throat with cocaine solution. This procedure, though simple enough, often causes considerable discomfort. It may even cause collapse if the patient is sensitive to cocaine. After an interval to allow the nose and throat to become anaesthetized the catheter is passed through the nose and down the larynx. The ease with which this is performed will depend upon the patient in question and upon the skill of the manipulator. There may be difficulty in passing the catheter through the glottis; the patient may choke violently and try to pull out the tube, which may even pass into the oesophagus. Though the method is satisfactory in skilled hands, it is not always easy and not always without distress to the patient.

Instead of passing a catheter by the nasal route it has been considered simpler to spray the back of the throat with cocaine and inject the oil over the base of the tongue. This is certainly more comfortable for the patient, but the preliminary cocaineization is often complained of as being more unpleasant than the injection of the oil itself; the patient usually has to hold out his own tongue throughout, and although the lower lobes can be filled well it is not easy to fill middle or upper lobe bronchi by this method. Not infrequently some oil passes down the oesophagus instead of the larynx.