

COUGH FRACTURE DURING PREGNANCY: REPORT OF A CASE.

J. S. BARR, M.B., Ch.B.

from the Obstetrical Unit, Stobhill Hospital, Glasgow.

Cases of stress fracture of ribs were recorded in the British literature at the end of last century (Skyrme, 1890; Atkinson, 1898). More recently in this country similar occurrences during pregnancy have received attention (Paulley, Sees & Pearson, 1949; Adkins, 1949). The following case report illustrates the occurrence of a rib fracture as the result of coughing.

A primigravida aged 26, and 36 weeks pregnant, was admitted to the antenatal ward at Stobhill Hospital on 9th March, 1949. Three weeks prior to admission she had an attack of coryza followed by a persistent cough. After one week's illness she had a bout of coughing while in the act of rising from bed, and while coughing she experienced sudden sharp pain in the left lower chest laterally. This persisted and was aggravated by deep inspiration.

On admission to hospital auscultation revealed signs of an acute bronchitis, and in addition there was localized tenderness over the 11th rib in the mid-axillary line on the left side, with pain in this area on antero-posterior compression of the chest. X-ray examination confirmed the presence of a fracture of the 11th left rib in the mid-axillary line; bone density appeared normal and blood chemistry revealed no significant abnormality: serum calcium, 9.5 mg.%; serum phosphorus, 4.1 mg.%; serum alkaline phosphatase, 13.1 units % (King Armstrong).

At the onset of labour the left chest was strapped with adhesive as a precaution against the muscular stress of the second stage. Spontaneous delivery occurred after 8½ hours' labour. Pethidine hydrochloride 100 mg. administered subcutaneously twice during the first stage, providing adequate sedation. The puerperium was uneventful. X-ray examination of the chest on 12th April, 1949, the 12th day of the puerperium, showed callus formation round the rib fracture.

Cough fracture has been noted particularly by workers in tuberculosis (Richardson, 1936; Cohen, 1949) probably because their patients are frequently x-rayed. The preponderance of lower rib fractures on the left side late in pregnancy has been stressed (Paulley *et al.*, 1949) and this may be due to the bulky uterus being driven violently upwards and backwards with the forceful contractions of the abdominal muscles in sneezing or coughing. The position of the liver seems to protect the right ribs and so the main blow falls on the left lower ribs. This mechanism may account for the more frequent occurrence of the condition only in later pregnancy when the uterus occupies the greater part of the abdominal cavity. Asymmetrical posture may predispose to fracture by producing uneven stress on the ribs during violent muscular action (Cohen, 1949). Fractures in the mid-thoracic region occur along the line of inter digitation of the external oblique and anterior serratus muscles (Oechsli, 1936) which suggests a shearing force mechanism. Fracture of the lower ribs may possibly be brought about by forcible contraction of the *ilio costalis*, depressing the ribs posteriorly with a simultaneous action of the abdominal muscle depressing the anterior extremities of the ribs, associated with fixing of the ribs by the taut *serratus anterior*, as when the patient rests on one elbow or raises herself up in bed.

The importance of decalcification of bone in the causation of this condition is difficult to assess. X-ray comparison of bone density against controls has proved inconclusive (Paulley *et al.*, 1949). The foetal demands on calcium and phosphorus make advisable a higher intake of these minerals in pregnancy, but the majority of pregnant women have a calcium intake considerably below the theoretical optimum (Browne, 1947), so that some degree of decalcification of bone may be present in late pregnancy although this is not revealed by x-ray examination or blood chemistry.

Probably none of the suggested mechanisms is, by itself, entirely responsible for the production of stress fracture in late pregnancy, and the condition is brought

about by a combination of uneven muscular stress, the postural changes of pregnancy, relative skeletal decalcification, associated with the position and size of the pregnant uterus.

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