Sonographic demonstration of atypical congenital anomalies in the fetus of a diabetic mother

A case report

R. SEIDER, G. VAN RENSBURG, B. DARAZS

Summary

Uncontrolled diabetes, particularly in early pregnancy during the stage of organogenesis, increases the risk of teratogenesis. A case of mixed congenital abnormalities in a fetus demonstrated ultrasonographically during the second trimester of pregnancy in an uncontrolled insulin-dependent diabetic mother is presented. Necropsy of the abortus confirmed the findings.

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Case report

An affluent, 26-year-old insulin-dependent diabetic woman, who lived in a rural area, had been controlling her diabetes symptomatically with Monotard injections, the dose varying in accordance with the subjective impressions of her glucose status. At the time of presentation at hospital her random blood glucose level was 18,1 mg/ml and the haemoglobin HbA_{1c} level was 10,9. Despite an approximately 12-year history of diabetes she had no retinal stigmata and normal renal function. The period of amenorrhoea had been 24 weeks when she was first seen in the ultrasound department and, although she had had 5 previous ultrasonographic examinations at peripheral clinics, these had failed to show any fetal abnormalities.

The findings at 1 Military Hospital included a fetal biparietal diameter of 4,5 cm, which suggested a sonographic age 5 weeks less than gestational age as calculated from the patient's last menstrual period. A femur length of 3,3 cm also indicated a fetal age of approximately 19,5 weeks but the humerus was 3,6 cm, in keeping with a 23-week gestation. The dating in our department is in accordance with the tables published by Sabbagha *et al.*[1] and Romero and Jeanty.[2] The lower limbs were shown to be motionless and flexed throughout the examination. The cervical and cranial dorsal spine appeared ultrasonographically normal, but the caudad thoracic and lumbar spine was absent (Fig. 1). Bright sacral echoes were demonstrated. The fetal pelvis was small and contracted but a normal bladder was identified. The liver, kidneys and heart were normal, but the cardiac echoes were placed eccentrically in the chest with bowel occupying the right chest. Three vessels were identified in the cord and the amniotic fluid and placenta were normal.

A therapeutic abortion was performed 1 week later and radiographs of the fetus were taken (Fig. 2). A careful necropsy

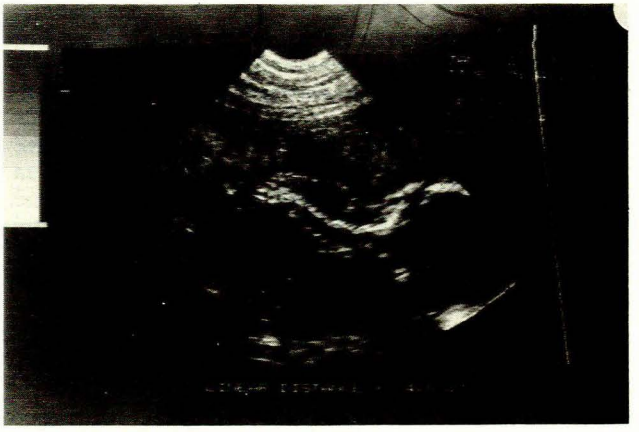

Fig. 1. Antenatal sonogram showing normal proximal spine with absence of spine distal to lower thoracic region (arrow).

Departments of Radiology and Ultrasound, 1 Military Hospital, Voortrekkerhoogte, Tvl
R. SEIDER, M.B. B.CH.
G. VAN RENSBURG, M.B. CH.B.
B. DARAZS, M.U.DR (BRATISLAVA), M.D.

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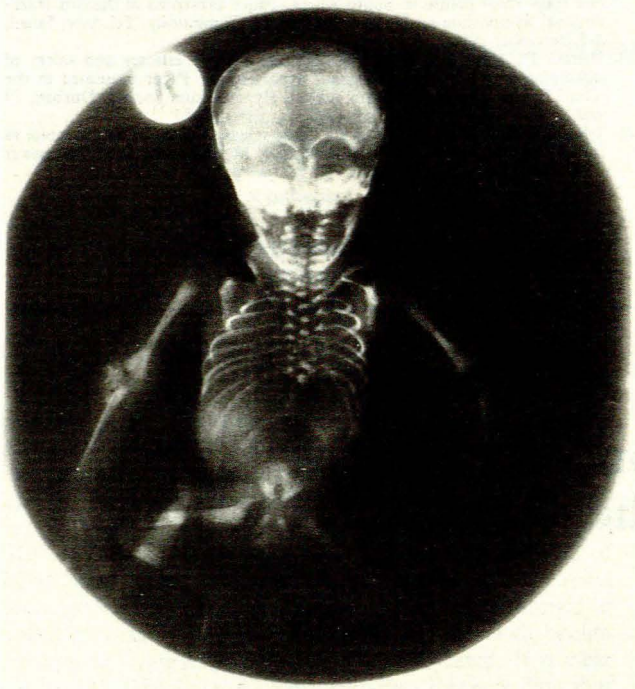

Fig. 2. Radiograph of abortus. Note hemivertebra C1, fusion of lower thoracic vertebrae and absence of cord distal to this, and absence of pelvic bones except for ischial tuberosities and sacral alae.

was carried out. The fetus was microcephalic but without structural abnormality of the brain. A hemivertebra of C1 was found, as well as fusion of T10 and T11 with hemivertebra at T11. No spine, spinal cord, or meninges were demonstrated distal to T11. Ten ribs were identified bilaterally. The legs were webbed, externally rotated and abducted at the hips, and flexed at the knees. There was a smalll undeveloped pelvis with only sacral alae and ischial tuberosities identifiable. The testes were bilaterally undescended. A right-sided diaphragmatic hernia was confirmed.

Discussion

There is a 3-6% incidence of congenital anomalies among offspring of diabetics.[3,4] Anomalies include the caudal regression syndrome, neural tube defects, anencephaly, microcephaly, cardiac, urogenital and gastro-intestinal anomalies as well as umbilical cord anomalies.[4–6]

Two important lessons may be learnt from this case. Firstly, it reaffirms the possible consequences of poorly controlled diabetes. In our case, simple patient education might have avoided these tragic consequences. Secondly, careful ultrasonography during the late first trimester and early second trimester by a skilled ultrasonologist is very important in diabetic mothers so that abnormalities may be picked up and dealt with early. In our patient, in whom the diagnosis had been missed previously, the diagnostician should have been alerted by the smallness of the head for gestational age. The spine should have been examined along its entire length. Absence of normal movement should have alerted the observant ultrasonographer to paralysis and abnormality of lower limbs.

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