

FOETUS PAPYRACEUS

(A Case Report)

by

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Intra-uterine death of one of the foetuses in twin pregnancy is a rare but interesting phenomenon. Once one of the foetuses dies, there are three possible terminations; spontaneous abortion of both the foetuses, extrusion of the dead foetus with continuation of pregnancy with the remaining foetus, or retention of both the foetuses and their delivery later on at or near term. In the last case, there are three possible pathological processes which may affect the dead twin retained in utero:-

i. The dead foetus may undergo maceration. This phenomenon is commonest of the three.

ii. The dead foetus becomes hard and apparently fixed without much flattening or loss of normal body contour. This hardening, instead of softening, is the very antithesis of maceration. This is known as mummification.

iii. Compression of the foetus into the semblance of old parchment, "Foetus Papyraceus". In this phenomenon the initial maceration has been arrested by mechanical pressure, preserving some of the foetal structures, in a way reminiscent of a flower preserved by pressure bet-

ween sheets of blotting paper. This phenomenon is not the same as mummification, although, some authorities make no distinction between the two (Titus, 1944; Stander, 1945; Strachan, 1947; Eastman, 1950).

The following is the case report of one such foetus papyraceus:-

CASE REPORT

Smt. L., 25 years old, third para, was admitted in the maternity wards of D. K. Hospital, Raipur, on 10-5-1968, at 1 p.m., with the history of amenorrhoea of 28 weeks, and labour pains and leaking of membranes for the last 24 hours. Her haemoglobin was 90%, blood pressure 90/60 mm. Hg. All systems were clinically normal. Abdominal examination revealed a uterus of 28 weeks' pregnancy; foetus was presenting by vertex, R.O.A., and the head was engaged. Foetal heart tone was normal. Vaginal examination revealed a completely taken up cervix which was $\frac{1}{2}$ dilated. Membranes were intact. At 3.50 p.m. the bag of membranes ruptured spontaneously, and at 4 p.m. a small compressed flattened foetus was expelled. Its cord broke spontaneously. At 6.15 p.m. she gave birth to a live male child. As she had slight third stage haemorrhage 0.2 mg. methergin was given intravenously. At 7.25 p.m. the single placenta was expelled. The first foetus was dry, flat, measured 3" in length, and weighed 25 gms. Its sex was male. The second child weighed 1 kg. 225 gms. and cried immediately after birth. No congenital malformation was detected. The placenta was uni-ovular, and weighed 325 gms. There were two amniotic sacs. The

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sac of the first child had a velamentous insertion of the cord. This part of the placenta was more vascular than the rest. The second amniotic sac was small and the cord was dry and shrivelled up. This part of the placenta contained white infarcts. The Kahn test of the patient and her husband were negative.

Comments

Much work has been done by Kadjar (1927), Dodd (1925), Quigley, Engelhorn (1955), & Mills (1949), on the structural changes and circulation in uniovular and binovular placentas. It was observed that intra-uterine death of one of the twins did not affect the time of onset of labour. In toxæmia and hydramnios, death of one twin caused relief to the patient. Engelhorn observed intrauterine death of one twin to be three times more common in uniovular than binovular twins. The usual explanation is that if one foetus has a stronger heart than the other, the circulation in the hypogastric arteries of the weaker foetus will be reversed, and its circulation may be brought to a standstill. When the foetus dies, it is usually retained in uterus and expelled along with the other at or near term. This fact is elucidated by studying the circulations in the placentae of twin pregnancies.

In binovular pregnancy, the two placentae are separate, and there is no anastomosis between their circulations. But Kadjar observed some anastomosis in 4 of his 27 cases. In one there was a superficial anastomosis between two arteries, and in another between two veins. In one between two superficial arteries, and in one intervenous, and in the third

a superficial venous and a deep inter-arterial anastomosis was found. These findings, could not be confirmed by Dodd and Browne in their 57 cases. In uniovular twins there is a single placenta. In 109 cases of mono-amniotic twins studied by Quigley, two separate umbilical cords, or two cords with a single umbilical attachment was found. Knotting of cord leading to death of one or both foetuses is common, the foetal mortality being 68.0 per cent. The circulation of twins in uniovular placenta communicates through the so called 'third circulation'. Schatz mentions such four varieties;—i. Placenta with deep anastomosis only.

ii. Those with a single (seldom double) superficial arterial anastomosis, in addition to several deeper ones.

iii. Those with a single (seldom double) superficial venous anastomosis, in addition to several deep ones.

iv. Those with a single (seldom double) superficial arterial and one venous anastomosis, in addition to several deep ones.

The deep anastomoses are always between vessels of opposite kind, i.e. between artery and vein, and are 10-20 in number. While the superficial anastomoses are between the vessels of same kind, namely between artery and artery, and vein and vein. The 'third circulation' was fully investigated by Newman (1923) in uniovular placentae. 5-10 per cent of the foetal blood flowing to each placenta may return in the umbilical vein of the other twin, and according to the anatomical extent of this anastomosis, one twin may be 'favoured'

with a gradually increasing blood volume, and the other may be progressively depleted. The 'favoured' one has a venous plethora, raised blood pressure, enlarged heart and kidneys and hydramnios. While the development of the other may be retarded, and it may fail to survive. The tissues in this dead foetus may be kept alive temporarily by a continuous transfusion through the 'third circulation'. If the foetus is killed at an early date due to reversal of blood flow in the umbilical arteries, an acardiac monster results. But if the anastomosis is predominantly venous, blood might gradually be withdrawn from the less vigorous foetus and its placenta, leading to underdevelopment, depletion, progressive dehydration, and ultimate death due to loss of body fluid. The placenta becomes avascular. The foetus shrinks and gets dehydrated; maceration is thus prevented.

The pathology of foetus compressus was studied by Kindred (1944) who reviewed the literature, and gave detailed observations of the process. Tissue autolysis progresses, but stops short of liquefaction. The outstanding features are the preservation of cardiac muscle despite the loss of structure of almost every other tissue, except bone. He refers to this condition as mummification, on the grounds that the foetus becomes leathery and dehydrated. He feels that the term 'mummification' should be restricted to those cases where the dead foetus is dehydrated without undergoing compression. Loss of liquor amnii occurs either by gradual absorption, or by leakage, or rupture of the sac. This leads to death of the foetus, and its compression by

the sac of the live foetus. Dehydration leads to the arrest of process of maceration, and leads to the formation of foetus compressus. He does not consider the vascular anastomosis as an important factor in its production. He elaborated a theory presuming that there is a secretion of special fluid possessing preservative properties, following rapid absorption of the original liquor amnii. But there is less evidence to support this theory. Browne (1946) considers the vascular anastomosis as an important aetiological factor in the production of this condition. He reviewed the literature, and mentioned that this condition may occur in uni- or binovular twins, though the relative frequency in both is difficult to decide.

Summary

1. Intrauterine foetal death of a foetus in twin pregnancy is an uncommon occurrence.

2. It may lead to premature termination of pregnancy, expulsion of the dead twin, or continuation of pregnancy, and birth of both foetuses at or near term.

3. The dead twin may undergo maceration, mummification or compression, the former being the commonest termination.

4. The presence of vascular anastomosis between the two foetuses in the placenta, 'the third circulation', may explain the phenomenon of formation of foetus compressus.

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