Haemangiomas of the placenta

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SYNOPSIS A series of six placental haemangiomas is described. Of these one was large and was associated clinically with hydramnios and premature labour. The remaining five were discovered in the course of a systemic examination of 500 unselected placentae. The literature on this tumour is reviewed and it is concluded that this is a very common lesion occurring in about 1% of all placentae. The tumour is probably hamartomatous in nature and is derived from primitive chorionic mesenchyme. Most tumours are small and intraplacental and are not associated with any clinical side effects. The comparatively small group of large haemangiomas do show an association with hydramnios, premature labour, low birth weight, foetal distress and, in a few instances, cardiomegaly in the infant.

Placental tumours, apart from hydatid mole and chorionepithelioma, are thought to be extremely rare. It is recognized that the haemangioma (chorangioma) is the most frequently occurring tumour of the placenta, but even this is thought of as being most uncommon, a view that is reflected in many current pathological texts and by the publication of single cases.

In this paper a series of six placental haemangiomas is reported and the pathological and clinical features of these tumours are reviewed. Throughout, the term 'tumour' will be used to describe the placental haemangioma for, although doubt exists as to whether this is a true neoplasm, this term is convenient and well established.

CASE REPORTS

Of these six cases, only one (case 1) was noted by the obstetrician at delivery and was associated with a typical 'chorangioma syndrome'. This is the only such case seen during the last five years at St. Mary's Hospital, Manchester, during which time there have been approximately 13,000 deliveries. The remaining five cases were discovered in the course of a systematic examination of 500 unselected placentae. These placentae were fixed whole in 10% formalin, then cut into vertical slices 0.5 cm. thick, and sections taken from all macroscopic lesions.

CASE 1 A patient, aged 40, in her second pregnancy, was known to be suffering from mild thyrotoxicosis and latent neurosyphilis. The pregnancy was normal until the last two weeks before delivery when she developed marked hydramnios and her blood pressure rose to 150/100 mm.Hg. The onset of labour was spontaneous

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at 40 weeks by dates, but at 36 weeks by *x-ray* maturity. Labour was uneventful and a live male child weighing 6 lb. 5 oz. was delivered. The child was healthy and showed no abnormality.

Placenta This weighed 640 g. Just beyond the margin of the placenta, situated in the membranes, was a rounded mass measuring $6 \times 9 \times 4.5$ cm. (Fig. 1). This weighed 120 g. and was of a fleshy colour and consistency. The tumour was connected to the placenta by a vascular pedicle. Histologically the tumour was formed by dilated thin-walled vascular channels with little intervening stroma. The tumour was encapsulated by a thin layer of fibrous tissue which in turn was covered by a single layer of syncytial cells.

FIG. 1. Case 1. Placenta: a large haemangioma is attached to the main placenta by a vascular pedicle.

FIG. 2. Case 2. Histological appearances of a placental haemangioma showing a typical mature 'angiomatous' pattern with numerous thin-walled, dilated vascular channels set in a loose fibrous stroma. (Haematoxylin and eosin $\times 150$.)

CASE 2 A primigravid patient aged 20 had an uncomplicated pregnancy with spontaneous onset of labour at 40 weeks. The child weighed 6 lb. 8 oz. and showed no abnormality.

Placenta The weight was 450 g. On slicing there was a well-demarcated, plum-coloured round intraplacental nodule measuring 0.75 cm. in diameter. Histologically this consisted of a network of thin-walled dilated vascular channels set in a loose fibrous stroma (Fig. 2). The tumour was demarcated from normal placenta by a thin capsule of fibrous tissue covered by a single layer of flattened epithelium. The placenta was otherwise normal.

CASE 3 A primigravid patient aged 27 after an uneventful pregnancy went into labour at 42 weeks and gave birth to a healthy live male child weighing 6 lb. 9 oz.

Placenta The weight was 460 g. On slicing there was a well-demarcated, reddish-brown intraplacental nodule 1 cm. in diameter. Histologically this was formed of dilated thin-walled vascular channels with little intervening stroma. The nodule was encapsulated by a thin rim of fibrous tissue covered by a single layer of syncytium.

CASE 4 A primigravid patient aged 17, after a normal pregnancy went into spontaneous labour at 38 weeks and gave birth to a live normal male child weighing 5 lb. 4 oz.

FIG. 3. Case 4. Photomicrograph showing placental haemangioma above, and normal villi below. This part of the tumour is formed of hypocellular myxomatous type tissue. (Haematoxylin and eosin $\times 150$.)

FIG. 4. Case 4. Photomicrograph of another area of the same tumour shown in Figure 3. In this area there is transition to an angiomatous pattern with many small vascular channels. (Haematoxylin and eosin $\times 150$.)

Placenta This weighed 390 g. and on slicing there was a well-delineated, firm, tan-yellow intraplacental nodule 1.5 cm. in diameter. Histologically this consisted largely of loose myxomatous mesenchymal tissue (Fig. 3) but in one area there was a transition to an angiomatous pattern (Fig. 4). The angioma was encapsulated by a single layer of flattened syncytial cells.

CASE 5 A primigravid patient, aged 31, at the 32nd week of pregnancy developed moderate ankle oedema and her blood pressure rose to 140/100 mm.Hg. The blood pressure remained elevated and labour was induced at the 39th week when she gave birth to a male twin, one child weighing 6 lb. 15 oz. and the other 6 lb. 12 oz. Both were healthy and normal.

Placenta This was bichorionic and bi-amniotic, the placentae weighing 340 g. and 470 g. respectively. The heavier placenta showed no significant abnormality on slicing, but the smaller contained a firm, yellowish, well-demarcated subchorionic nodule 2 cm. in diameter. Histologically this consisted of numerous dilated thin-walled vascular channels with little intervening stroma. The nodule was encapsulated by fibrous tissue outside of which was a deposit of fibrin in which there were many cytotrophoblastic cells.

CASE 6 A patient, aged 36, in her twelfth pregnancy, after an uneventful gestation went into spontaneous labour at 41 weeks and gave birth to a normal live female child weighing 7 lb. 3 oz.

Placenta This weighed 355 g. and on slicing there was a firm, well-demarcated brown intraplacental nodule. Histologically this was formed of loose cellular fibrous tissue in which were set numerous small vascular channels. The nodule was encapsulated by a single layer of syncytial cells.

DISCUSSION

The first description of a placental haemangioma is accredited to John Clarke in 1798. By 1939 Marchetti was able to collect 209 cases from the literature and added a further eight of his own. Since that date it has been possible to trace reports of nearly 100 further cases and these, together with the six cases described here, bring the total of reported cases to above 300. Over 167 years this is a relatively small number of cases and would appear to support the rarity of these tumours. The reported incidence of placental haemangiomas, however, varies considerably. Many workers have noted the frequency of clinically obvious, or easily visible tumours over a period of years and then divided this figure by the number of deliveries in that period. This gives a very low incidence, *e.g.*, 1 in 8,000 (Leopold, 1895), 1 in 10,000 (Schickel, 1924), 1 in 9,000 (Kühnel, 1933), 1 in 3,500 (Marchetti, 1939), and 1 in 11,000 (Begg, 1961). On the other hand, all careful studies of sliced placentae have recorded an extremely high incidence of haemangiomas, *e.g.*, 6 in 600 (Siddall,

1924), 7 in 500 (Dunn, 1959), 4 in 562 (Zeek and Assali, 1952), 4 in 100 (Assche, van Brosens, and Lauwerijns, 1963), 8 in 620 (Wentworth, 1965), and 3 in 376 (Wilkin, 1965). In the present series five haemangiomas were found in 500 placentae and there seems little doubt that these tumours do occur in about 1% of all placentae. A cursory examination of placentae will miss most haemangiomas for many are both small and intraplacental.

In most cases only a single tumour is present but in a substantial minority there have been multiple tumours in a single placenta, whilst Burger, Fruhling, and Wurch (1952) and Bret, Loewe-Lyon, Duperrat, and Gauthier (1953) have described placentae that were diffusely infiltrated by tumour. The haemangioma is seen most frequently as a protuberance on the foetal surface of the placenta but some occur on the maternal surface. Occasionally the tumour is in the membranes and is attached to the placenta by a vascular pedicle. Many small haemangiomas are intraplacental and not visible externally. The haemangiomas vary in size from under 1 cm. in diameter to a tumour 'as large as a child's head' (Emge, 1927). The cut surface may be red, plum-coloured, tan, brown, or whitish-yellow, and is usually firmer and more compact than normal placental tissue. If intraplacental, the tumour is clearly demarcated from the surrounding tissue and often has an easily visible capsule.

The tumours vary in their microscopic appearances and Marchetti (1939) described three histological types:—1 Angiomatous, in which the tumour is formed of dilated blood vessels set in a loose stromal tissue. 2 Cellular, the tumour being formed of loose immature cellular mesenchymal tissue. 3 Degenerate, tumours in which myxomatous, hyaline, or fibrinoid degeneration has occurred, often with calcification.

Although this histological classification is useful for descriptive purposes it does not indicate any fundamental differences between the various sub-varieties, for the cellular type is simply an immature form of the angiomatous type and many tumours show a variable pattern, being cellular in some areas and angiomatous in others.

There is little doubt that these tumours are haemangiomas, but whether they are true neoplasms or hamartomas is disputed. Dunn (1959) concluded that the placental haemangioma is a true tumour and based his view on the presence of occasional mitotic figures and upon the evidence of disproportionate growth between the angioma and the rest of the placenta. Other workers have supported this view (Davies, 1948; McInroy and Kelsey, 1954) but a majority opinion now favours a hamartomatous origin (Pensa, 1932; Panini, 1947; Karnau-

chow, 1957; Strakosch, 1956). The actual site of origin is also disputed. Siddall (1924) thought that the tumour arose as a malformation of a single villus, whilst Marchetti (1939) evoked an origin from chorionic mesenchyme. Davies (1948) suggested an origin from primitive angioblastic tissue and was supported in this view by McInroy and Kelsey (1954). Certainly the cellular or immature type of tumour closely resembles the stroma of a very early chorionic villus, a tissue that later gives rise to numerous vascular channels, and the histological appearances of a mixed tumour, *i.e.*, one with both cellular and angiomatous areas, mimics the appearances seen in a chorionic villus during angiogenesis. Opinion now favours a hamartomatous origin from primitive chorionic angioblastic mesenchyme—possibly from a single villus. It is generally accepted that these tumours are benign, although Ahrens (1953) described a case which he thought was an angiosarcoma on the basis of many mitotic figures and of considerable pleomorphism within the tumour.

Many placental haemangiomas are accompanied by clinical side effects. Hydramnios is common (Siddall, 1924; De Costa, Gerbie, Andresen, and Gallanis, 1956) and often causes premature labour. Approximately a third of the cases reported have been complicated by hydramnios but this is only true with large angiomas, *i.e.*, above 4 cm. in diameter. The cause of the hydramnios is obscure but was attributed to Kotz and Kaufman (1939) to transudation of fluid from the tumour vessels. McInroy and Kelsey (1954) argued that the blood circulating through the tumour has not actually passed through the placenta, and hence waste products usually excreted by the placenta will be returned to the foetus. This will lead to excess secretion of foetal urine with resulting hydramnios. Nevertheless, there has been a case of a large placental haemangioma reported in association with oligohydramnios (Resnick, 1953).

Antepartum haemorrhage has occurred in some cases (Horn, 1948; Earn and Penner, 1950) and this may be due either to premature separation of the placenta as a result of retroplacental bleeding from the tumour or to rupture of the vascular pedicle of an intramembranous tumour. The excess of premature labour in cases of placental haemangiomas is due either to hydramnios or antepartum haemorrhage and in the absence of these factors the gestational period is normal. Intra-uterine death has been reported on several occasions, but is usually due to an unrelated abnormality of pregnancy, *e.g.*, pre-eclamptic toxæmia (Heggtveit, Carvalho, and Nuyens, 1965), but in a few cases the only abnormality was the presence of a large placental haemangioma and Dunn (1959) has suggested that

the foetus may die as a result of blood being shunted into the tumour and hence not being oxygenated.

Heggtveit *et al.* (1965) have claimed that pre-eclamptic toxæmia is unduly common in cases of placental haemangioma, but this would not appear to be substantiated from a study of the reported cases. In the present series of six cases, two did have mild pre-eclamptic toxæmia but the collected series of 500 placentae did include 200 from known cases of pre-eclamptic toxæmia.

Labour is usually normal though dystocia due to a very large tumour has been recorded on two occasions (Margeson, 1920; Emge, 1927). Foetal distress is not uncommon in cases of large tumours (Yule and O'Connor, 1964) and may again be due to shunting of foetal blood through the tumour.

In most cases the child is normal but there does occasionally appear to be a relationship between large placental haemangiomas and a low birth weight (Gruenwald, 1963; Wilkin, 1965). Although a number of associated congenital abnormalities have been recorded, the incidence of such defects does not appear abnormally high, and the association is probably fortuitous. Skin angiomas have been present in some cases (De Costa *et al.*, 1956; Ciulla, 1939; Bret, *et al.* 1953; Zawirska, 1964) and haemangioma of the liver in one case (De Costa *et al.*, 1956). In two infants cardiomegaly has been described (Benson and Joseph, 1961; Begg, 1961) and is attributed to increased cardiac output required for the shunting of blood through the tumour. Certainly, examination of the placenta is indicated in any case of unexplained neonatal cardiomegaly.

Thus, from the study of the reported cases the following features emerge:

- 1 Placental haemangiomas are common, occurring in approximately 1% of all placentae. Most tumours are small and intraplacental and are unaccompanied by clinical side effects.

- 2 The relatively small group of large tumours is associated with hydramnios, ante-partum haemorrhage, premature labour, and possibly with foetal distress and a low birth weight. In a few cases cardiomegaly may occur in the infant.

- 3 Most of the claims for other associated clinical features are based on single case reports and are not substantiated by a review of the accumulated literature.

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