PLACENTAL LESIONS IN EARLY ABORTIONS*

by

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The elusive aetiology of early abortions tempted us to study a series of abortions up to 20 weeks of pregnancy. We have presented in this paper an analysis of one hundred cases of such abortions with special reference to histopathological changes in their placentae. Various types of placental changes have been described in the literature and it is interesting to know how these pathological changes operate in the termination of pregnancy. Early cystic degeneration in the chorionic villi may account for a large percentage of cases (Storch, 1878). This has been regarded as a highly potent cause for mole formation at a later date (Hertig and Rock, 1944). Fibrinoid degeneration of the chorionic villi either patchy or diffuse in association with syncytial degeneration, endarteritis, fibrosis and clubbing of its terminal end are considered to be common types of placental changes. Hydropic degeneration of the chorionic villi together with haemorrhage is found in association with recent haemorrhage, necrosis and inflammation of the decidua (Novak, 1962).

Our material consisted of the products of conception aborted spontaneously or obtained by curettage following abortions. On histological examination of chorionic villi 20% showed no abnormalities. In the remaining 80 cases the different types of lesions with their frequency of occurrence have been tabulated below:

TABLE I

Histopathological lesions in the Chorionic villi

Lesions	No. of lesions
Degenerative	
1. Hydropic degeneration	39
2. Necrosis	22
3. Hydatidiform degeneration	21
4. Hyaline degeneration	17
5. Fibrosis	14
6. Fibrinoid degeneration	10
7. Calcification	4
Associated	
8. Decreased vascularity	30
9. Proliferation of stroma	12
10. Atrophy of the epithelium	10
Inflammatory	
11. Inflammation	24
12. Haemorrhage	17
Associated	
13. Thickening or dilatation of blood vessels	8

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It will be noted that basically the lesions in the chorionic villi were degenerative (78.5%) and inflammatory (12.5%).

We could obtain 24 pieces of decidual material for our study. The histopathological lesions in the decidua have been presented in Table II.

TABLE II

Lesions in the decidua

Lesions	No. of lesions
Degenerative	
1. Necrosis	6
2. Fibrosis	3
Inflammatory	
3. Haemorrhage	11
4. Inflammation	10

It will be noted again that the basic lesions were degenerative and inflammatory as in the case of chorionic villi, but the incidence was quite different — degenerative 30% and inflammatory 70%, almost in the reverse order.

In the context of greater frequency of the degenerative and inflammatory lesions in our series it was interesting to observe that the duration of bleeding associated with abortion had a significant influence on the type of lesions as will be noted in Table III and IV.

The tables clearly demonstrate that when bleeding persists for more than 48 hours the inflammatory lesions in the chorionic villi increase

TABLE III

Distribution of lesions of chorionic villi according to the duration of bleeding

Duration of bleeding	No. of degenerative lesions	Percentage	Total	No. of inflammatory lesions	Percentage	Total
4-25 hours	29	12.7		6	2.6	
25-48 hours	30	13.1	25.8	7	3.2	5.8
49 hrs-10 days	71	31.1		22	9.7	
11 days & more	49	21.5	52.6	14	6.2	15.9

TABLE IV

Distribution of decidual lesions according to duration of bleeding

Duration of bleeding	No. of degenerative lesions	Percentage	Total	No. of inflammatory lesions	Percentage	Total
4-24 hours	1	3.3		0	0	
25-48 hours	1	3.3	6.6	2	6.7	6.7
49 hrs-10 days	3	9.9		7	23.4	
11 days & more	5	16.5	26.4	11	36.9	60.3

3 times (5.8% to 15.9%) whereas the degenerative lesions increased only twice (25.8% to 52.6%). Similar changes affect the decidua with the increase in the duration of bleeding. The inflammatory lesions are increased tenfold as compared to only about four fold rise in the degenerative lesions. The relative figures of degenerative and inflammatory lesions seem to be significant. The number of cases studied, however, was rather small and further study may modify the figures. Other workers have not split up these lesions and hence it is difficult to compare our figures.

It is seen that the majority of lesions were degenerative when the number of days of bleeding was less than two. When this number exceeded two days the inflammatory element greatly increased. This is probably due to the fact that all these abortions start primarily as degeneration in the chorionic villi. Once the degenerative process starts the conceptus dies and the whole conceptus is expelled within a short time. These were mainly cases of complete abortion. Photomicrograph 1. shows a case of complete abortion where the lesions are mainly degenerative. There is also evidence of decreased vascularity. This again proves our contention that it is primarily the defect in the vascular pattern which is the cause of early abortion. Once the degenerative process starts, the dead tissue behaves as a foreign body and an aseptic inflammation sets in. Since there was preponderance of inflammatory lesions in cases where bleeding persisted for more than 48 hours it is reasonable to assume that the inflammatory process has taken the upper hand in initiation and completion of abortion in that group.

The association of these lesions with two definite clinical groups was found to be significant. The first group consisted of those cases which were preceded by a brief period of pre-abortion bleeding. The other group had a relatively longer period of bleeding. The former showed mainly degenerative lesions whereas in the latter inflammation was a major factor. Degenerative change in the villi at an early age of pregnancy probably results in severence of connection with the decidua due to a layer of haemorrhage all round. This might turn into a carneous mole. The abortion is smooth and not accompanied by much bleeding. The other clinical group where there was marked pre-abortion bleeding consisted of mainly inflammatory lesions. In these cases the decidua showed extensive haemorrhage associated with inflammatory lesions as seen in photomicrograph 2. These were associated with prolonged periods of bleeding. At the first bleeding episode the woman thinks that she has aborted. Later on when the bleeding recurs she comes in an acute stage requiring curettage.

Referring to Table I again it seems that the type of degenerative change that predominated was hydropic degeneration. Photomicrograph 3 shows a typical picture of the lesion in the chorionic villi. This was found more commonly in 6-12 weeks conceptus (74.4%) and more frequently in primigravidae. We shall refer to it again later.

As the earliest degeneration noted among the conceptus was hydropic,

one feels that it is the starting point of all abortions. This may be due to a defective formation of blood vessels in the chorionic villi. Depending on the duration of bleeding and various other factors the other types of degenerations follow. This explains why in one tissue different types of lesions are noted. It is the continuation of process where probably the forebearer is hydropic degeneration.

A study of the age of conceptus in these cases shows that hydropic and hydatidiform degenerations are found early, between 6-12 weeks, whereas the others seem to occur at a later period. This again seems to confirm the view that the majority or all of them start as hydropic degeneration. The other types of degeneration are later developments. From the results of our investigation we agree with Novak that hydropic degeneration in early weeks may later result in hydatidiform degeneration. Photomicrograph 4 shows both hydropic and hydatidiform degenerations occurring simultaneously.

In respect of parity it was noted that the hydropic degeneration and necrosis were found more commonly in primigravidae whereas the fibrinoid degeneration and calcification supervened in multiparae. This may be associated with the vascularity of the decidua. Greater association of this type of degeneration with primigravidae may be attributed to an inherent defect in the germ plasm. There is a scope for examination of the husband in every case of abortion where sperm analysis may be helpful. A pre-abortion examination of the woman may probably show a hypoplastic uterus. All these may be explained by an inherent defect in the germ plasm. There is a good field of research in this direction.

A scrutiny of associated lesions shows that decreased vascularity was associated with hydropic, hydatidiform and hyaline degenerations. Proliferation of the stroma was present in association with cases of fibrosis, fibrinoid degeneration and calcification. The explanation for the former association seems to be obvious as our contention is that these degenerations are primarily due to a defective vascular tree. It may either show as non-development, an ill-development of the vessels or a decreased vascularity. The explanation for the latter again may be sought in finding out the chemical status of blood in the decidual blood vessels.

Summary

A histopathological study of 100 cases of placentae in cases of abortion upto 20 weeks was done. In 20% no apparent cause could be found. In the other 80% various degenerative and inflammatory lesions were noted. A scrutiny of the pathological lesions in this series shows that the primary defect lies in the defective formation of the vascular tree. There is either a non-development or defective development of vessels in the chorionic villi. Hydropic degeneration which was found to be the commonest type of degenerative lesion is a connective tissue degeneration and was found to affect the chorionic villi. This gives strength to our contention that primary vascular defect is the main aetiological factor in early abortions.

A close study of these lesions seems to indicate their association with two

very definite clinical groups. First is the complete abortion. This type mainly shows degenerative lesions. Here the bleeding usually lasts for less than 48 hours. It is also associated with less amount of pre-abortion bleeding. Once the degenerative process sets in the conceptus dies and the whole mass is expelled in one piece. The other clinical group is the incomplete abortion. The preponderance of inflammatory lesions in this group makes it reasonable to assume that inflammation plays a major role in the initiation and completion of abortion. This group is also associated with a larger amount of pre-abortion bleeding.

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Figs. on Art Paper I