

Histopathological Study of Placenta in cases of Intrauterine Fetal Death

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Abstract

Background: Intrauterine death is unpredictable event & placenta play an important role in pregnancy outcome as nutrition of fetus relies on placental vasculature & further growth & development throughout pregnancy. Placenta is most accessible & readily evaluable specimen. Since many cases of IUFD are associated with placenta, so it important to study pathology placenta which gives insight into intrauterine events so as to prevent recurrent pregnancy loss.

Objectives: Study histopathological study of placenta to provide information regarding causes of IUFD so as to find out treatment options for their prevention in future pregnancies.

Materials & Methods: 2-year study done on 50 placenta specimens at MGM medical college from December 2020 to December 2022. All the placenta specimens sent for histopathological examinations were studied. Autolysed specimens are excluded. Placenta were fixed in formalin after bread loafing at 1 cm interval, 2-4

sections from placental disc, 2 sections from membranes & one from umbilical cord were taken & histomorphology was studied on H & E sections.

Results: Histopathological study of placenta showed following findings Peri villous fibrin in 60% cases, intervillous haemorrhage in 55% cases, Calcification in 50% cases Prominent syncytial knots in 45% cases Cytotrophoblastic proliferation in 40% cases, Fibrinoid necrosis in 20% cases & Villitis in 10% cases.

Conclusion: Study of histomorphology of placenta gives information regarding abnormalities during pregnancy & thus evaluation of IUFD which will help in management of risks associated with future pregnancies.

Keywords: IUFD, Placenta Pathology.

Introduction

IUFD is a challenging Obstetric complication & its etiology is multifactorial with more than 60% causes attributed to placenta. Present study is done to understand the placental lesions underlying IUFD.¹

Worldwide 4 million intrauterine fetal deaths reported each year. In developing countries 1 in 200 pregnancies results in IUFD. In India perinatal death rate is 32/100 live birth & still birth rate is 9/1000 live birth.¹

Mother, fetus & placenta are involved in complex process of fetal deaths. Thus examination of placenta provides records of pregnancy & effects of pregnancy changes reflecting intrauterine environment.¹

Placenta can be considered as diary of pregnancy which remains viable for several days after fetal death.^{2,3}

Considering the above facts study of placental pathology plays an important role in diagnosis of causes of fetal death & prevention of further recurrences.^{1,2,3,4}

Present study was done to find placental pathology in cases of intrauterine fetal death.

Material & methods

Study done at department of pathology from December 2020 to December 2022 in tertiary care hospital for detection of placental pathology in IUFD.

Total No. of Cases studied-50

Inclusion criteria

All the specimens of placenta received to histopathology department from cases of IUFD were studied.

Exclusion Criteria

Autolyzed specimens.

Specimens are collected after delivery & gross examination of membranes cord & placental disc was done.

Weight was taken & size of placenta in terms of length & smallest diameter was taken. Thickness was taken at the center of placental disc.

Maternal surface was examined for hematoma, calcifications, infarct, thrombus & cysts.

Fetal surface was examined for color, Transparency of membranes, vessels for thrombi, calcification, or sub chorionic fibrin, or nodule below the amnion or chorion. Placenta was cut at distance of 1cm interval & kept for fixation for 24 hours. After fixation sections were taken as follows.

Placental disc: -2-4 sections

2 sections from basal plate of central region of placenta.

2 sections from periphery of placenta including basal plate & chorion.

Membranes: 2 sections

Bernischke technique of taking membrane roll for histopathological examination was done. Segment of 10 x 5 cm was cut out & membranous segment rolled on forcep & placed in fixative & after hardening sections were given so that large area of membranes can be examined.

Umbilical cord: 1 section

Cut off from disc at 2.4 cm above its insertion into fetal membrane.

Discussion

In our study maternal clinical parameter like age & gravida was studied & we found that. It is most commonly seen in age between 20-25 (i.e., Reproductive age) similar findings was in accordance with study done by Patel S et al (2014)² Dave et al (2016).³

IUFD causes were more in Primigravida similar to Ujjwal CHS et al (2013)⁴ & Sharma I et al (2016)⁵

Causes of IUFD

Material Causes > Placental

Causes > foetal causes 70% 25% 5% Similar to study done by, Prasanna A et al (2015)⁶ & Ujjwalla CH et al (2013)⁵

Placental pathology in PIH

Total PIH cases 60% out of 50. Choudhary et al⁷, Prasanna N et al⁶, Patel S et al² also reported PIH as a leading cause.

Which was more seen in preterm similar to study done by Balu D et al.⁸

Gross finding of PIH were infarct, hematoma & calcification which was similar finding in Ratnamala S. et al study.⁹

Microscopic findings in PIH cases syncytial knots, cytotrophoblastic proliferation, fibrinoid necrosis & calcifications.

Vijayalaxmi Setal & (2015) also found similar findings in their study.¹⁰

Placental pathology in Gestational diabetes mellitus

GDM causing IUFD found in 15% cases/50 similar to study done by Patel s et al (2016).²

Grossly they showed calcification & infarct similar to study done by Ratnamala S et al.¹⁰

Microscopy showed chorioamnionitis of membranes, syncytial knots, intergrillous hemorrhage similar to study done by Ratnamala S et al.¹⁰

Placental Pathology in Anemia

Anemia causing IUFD found in 25% cases

Grossly placenta showed infarction, calcification & retroplacental hematoma & microscopically they showed syncytial knots, perivillous fibrin & fibrinoid necrosis similar to Abaskeet al^{11,12,13}

Results

This was study done at tertiary care hospital on 50 placenta specimens for the duration of 2 years from December 2020 to December 2022.

Maximum number of IUFD cases (50%) found in 25 to 50 years of age group which were more common in primigravida (50%)

Male foetus was more than Female intrauterine fetal death i.e., 68%

We found that maternal causes of IUFD was the most common category of disorders (75%), followed by 20% Placental causes followed by 5% of fetal causes

Among Maternal Causes,

Commonest causes of IUFD were found to be PIH 21 cases out of 35 (60%) Anemia in 10 out of 35 cases = 28.57%

GDM in 4 out of 35 cases = 11.40% shown in table 1

Among placental causes we found 9/12 (75%) cases were Abruptio Placenta 2/12 (16.70%) cases were Oligohydraminios 1/12 (8.3) % was Placenta Previa Results are shown in table 2

Gross findings of placenta from IUFD cases were as follows Calcification in 27 cases, Infarct in 18 cases & hematoma in 12 cases as shown in table 3

His to patho logical examination revealed Fibrinoid necrosis in 10 /50 cases =20% Villitis & hydropic villi 5 & 6 cases (10 & 12% respectively) Hemorrhage in 23 cases =46% Peri villous Fibrin in 30 cases =60% Syncytial knots in 22 cases =44% Cytotrophoblastic proliferation in 20 cases =40% cases Results are shown in table 4

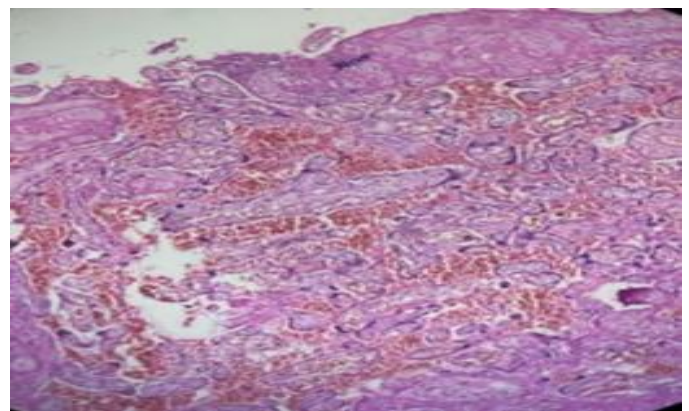


Figure 1: Intervillous hemorrhage

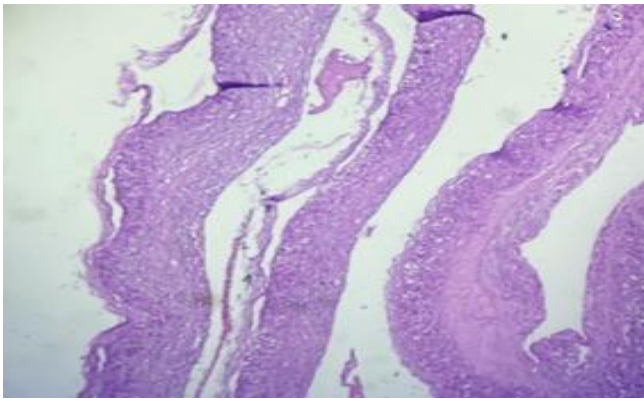


Figure 2: Membrane inflammation

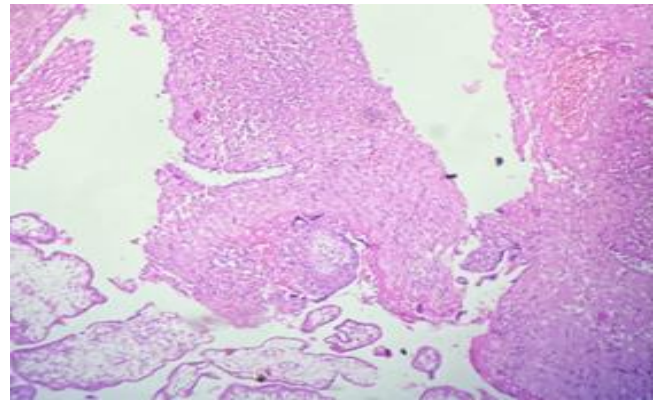


Figure 5: Fibrinoid necrosis & inflammation

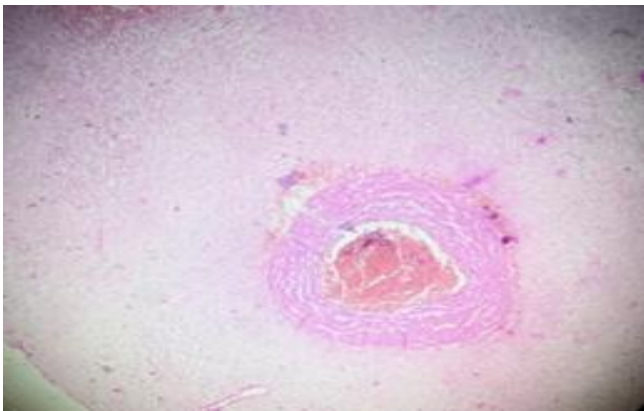


Figure 3: Arterial thrombus

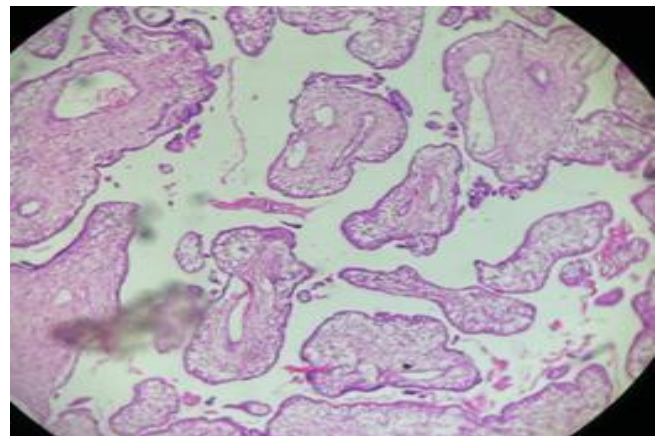


Figure 6: Oedematous villi & syncytial knots

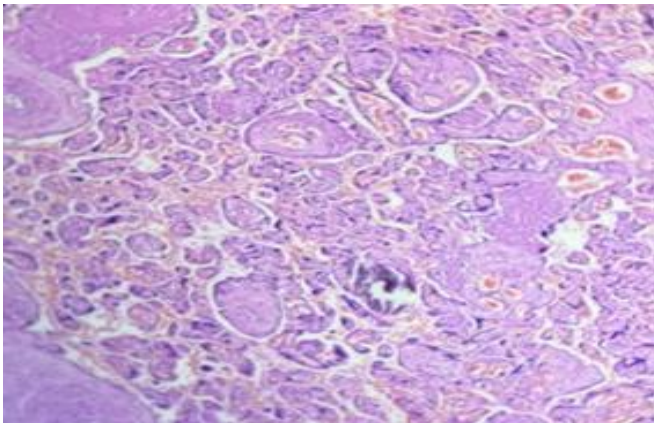


Figure 4: Intravillous calcification

Table 1: Maternal causes of IUFD

Material Causes of IUFD	Number of Causes (n=35)	Percentage (%)
PIH	21	60%
GDM	04	28.57%
Anaemia	10	11.40%

Table 2: Placental causes of IUFD

Placental Causes of IUFD	Number of Causes (n=12)	Percentage (%)
Placental Abruption	09	75%
Placenta Previa	01	16.7%
Obligohydramnios	02	8.3%

Table 3: Gross findings of placenta in IUFD

Causes of IUFD	Calcification 27/50	Infarct 18/50	Hematoma 15/50
PIH	16	9	5
GDM	1	2	2
Anemia	5	4	0
Placenta Previa	3	2	1
Placental Abruptio	1	1	6
Oligohydramnios	1	0	1

Table 4: Microscopic findings in IUFD cases

Microscopic findings of placenta in IUFD	Number of Causes (50)	Percentage
Peri villous fibrin	30	60%
Intervillous haemorrhage	23	46%
Syncytial Knots	22	44%
Cytotrophoblastic proliferation	20	40%
Fibrinoid necrosis	10	20%
Villitis	5	10%
Hydropic villi	6	12%

Conclusion

Study of Placenta pathology gives information regarding abnormalities during pregnancies & thus evaluation of IUFD. In present study PIH & anaemia are most common causes of IUFD which is associated with retroplacental insufficiency leading to placental infarction & fibrinoid necrosis. Thus study of placental pathology in IUFD cases helps to find out causes of IUFD & thus management of risks associated with future pregnancies

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