

**HISTOPATHOLOGICAL CHANGES OF PLACENTA IN THE ABORTED WOMEN
ACCOMPANIED WITH HUMAN CYTOMEGALOVIRUS (HCMV) INFECTION**

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ABSTRACT

This study was conducted to evaluate the histopathological changes in aborted women who had positive ELISA results for anti-human cytomegalovirus (HCMV) IgG and IgM antibodies. The histopathological changes in the placental specimens were involved placentitis and intranuclear or intracytoplasmic inclusion bodies which considered being pathognomic for HCMV infection.

KEYWORDS: HCMV, Placenta, Inclusion Bodies, Abortion

INTRODUCTION

The development of the placenta requires differentiation of specialized epithelial stem cells, referred to as cytotrophoblasts, in both floating villi (where they fuse into multinucleated syncytiotrophoblasts covering the villous surface), and anchoring villi (where they aggregate into columns of single cells invading the endometrium and the first third of the myometrium). While the syncytiotrophoblast is in a direct contact with maternal blood, mediating the transport of multiple substances to and from the fetus, the cytotrophoblast columns also invade maternal arterioles by replacing endothelial and smooth muscle cells and thus generating a hybrid cell population of fetal and maternal cells inside uterine vessels. Syncytiotrophoblasts upregulate expression of the neonatal immunoglobulin G Fc receptor, involved in transport of maternal IgG to the fetus^{1,2}.

There were several potential routes of placental infection, including ascending infection from the genital tract as well as hematogenous transmission². HCMV infects the placenta through the transportation of the virus across the placental barriers which may occur before fetus infection³. However; this infection may be restricted to the placenta⁴. These evidences gave the important idea that HCMV may contribute to unlike pregnancy results⁵.

Materials and Methods

A total of 30 placenta samples obtained from aborted women in curettage theatre who had seropositive results for anti-HCMV IgG and IgM. To study the histopathological changes and notice of inclusion bodies, small pieces of placental tissue were taken. Preparation of tissue sections and staining were performed according to Luna and Lee ⁶.

Results and Discussion

The pathological changes include variable inflammatory responses especially at chorionic villi or in the stromal region as well as cytotrophoblastic region. The microscopic picture of placenta included necrosis of chorionic villi and proliferation of cytotrophoblast figure (1).

Congestion of blood vessels and edema in the villous stroma as well as necrotic areas and calcification of infected area can also be seen in some sections (figures 2, 3).

The chorionic plate was involved with severe congestion of blood vessel. Also there was neutrophil infiltration and vacuolar degeneration at the decidual cells as shown in figure (4).

The specific pathognomic lesion of HCMV infection was the appearance of intranuclear or intracytoplasmic inclusion bodies. Sometimes, there is enlargement of infected cells (cytomegalic) (figure 5, 6) and deposition of calcium with necrosis in varying areas of tissue (figure 7).

Figure (8) shows that the intracytoplasmic inclusion bodies of macrophage. In some instances, the pathologic changes developed to fibrosis at villous stroma. Also, there was thickening of blood vessels due muscular hypertrophy with hyperplasia of the cells in the stromal region as in figure (9). The extensive inflammatory changes may leads to desquamation of cytotrophoblast, with severe necrosis and neutrophil infiltration as shown in figure (10) and (11).

The overall results are in accordance of Ozer ⁷, who showed that the placental infection may be ascending from infected amniotic fluid or vasculopathic problems (hemorrhages or thrombi), and the fetus may reveal an inflammatory response associated with cytokine production which leads to its damage. The inflammatory response was evidenced by neutrophil migration from the fetal vasculature of the umbilical cord or chorionic plate then infects the amniotic fluid. Also the current results considered to be consistent with Redline, who showed that the vast majority of infectious villitis was due to HCMV and *Treponema pallidum* which occupy approximately 90% also in chronic form of infection ⁸.

The same author also showed that the HCMV placentitis mainly accompanied by the appearance of intranuclear or intracytoplasmic trophoblastic inclusions which are seen easily when the section is stained with hematoxyllin and eosin stain. A study showed that organs with inclusions have a median viral load two logs higher than those in which inclusions could not be seen⁹ (Mattes *et al.*, 2000). An author showed that the calcification or hemosiderin deposition occurred due to capillary damage and the dystrophic mineralization due to villous damage⁷.

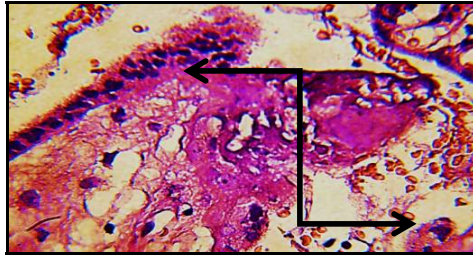


Figure (1): Histopathological section in the placenta of aborted women shows necrosis of chorionic villi and local proliferation of cytotrophoblast (arrows) (H&E stain 40X).

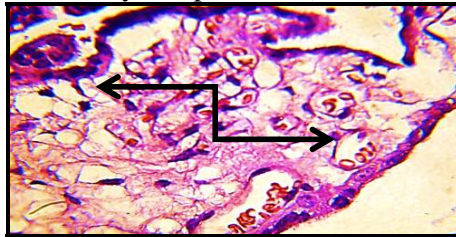


Figure (2): Histopathological section in the placenta of aborted women shows congestion of blood vessels and edema in the villus stroma and syncyncial cells in the cytotrophoplast of chorionic villi (arrow) (H&E 40X).

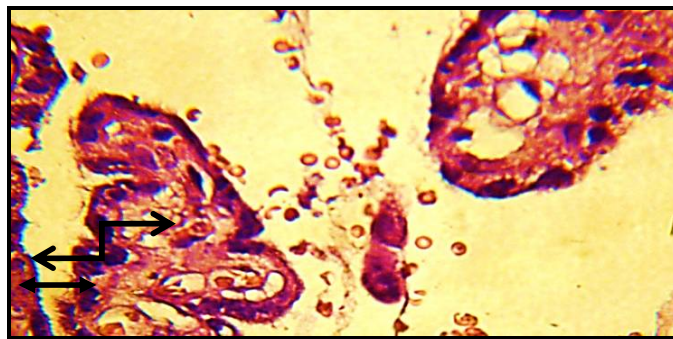


Figure (3): Histopathological section in the placenta of aborted women shows congestion of blood vessels and edema in the villus stroma and RBCs and neutrophils in the extravillous space (arrows) (H&E 40X).

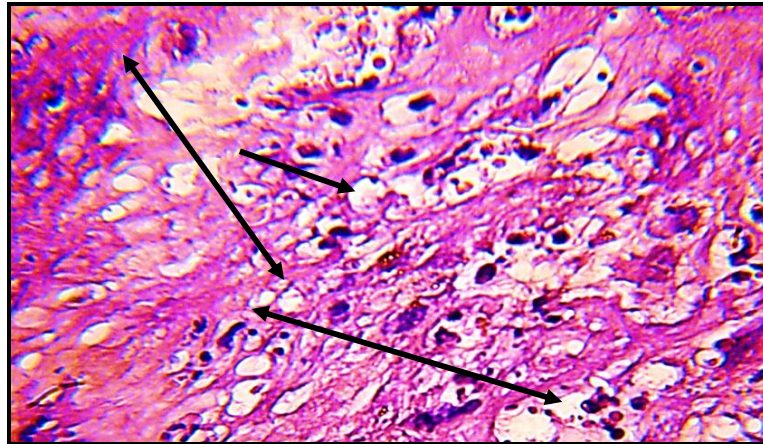


Figure (4):Histopathological section in the placenta of aborted women shows necrosis, congested blood vessels and neutrophils infiltration in the decidual area in addition to vacuolar degeneration of decidual cells (arrows) (H&E 40X).

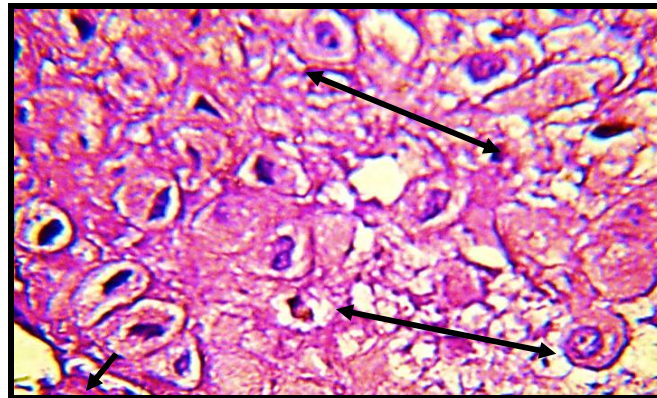


Figure (5): Histopathological section in the placenta of aborted women shows vacuolation in the decidual cell. Also there is intranuclear inclusion bodies with enlargement of cells (arrows) (H&E 40X).

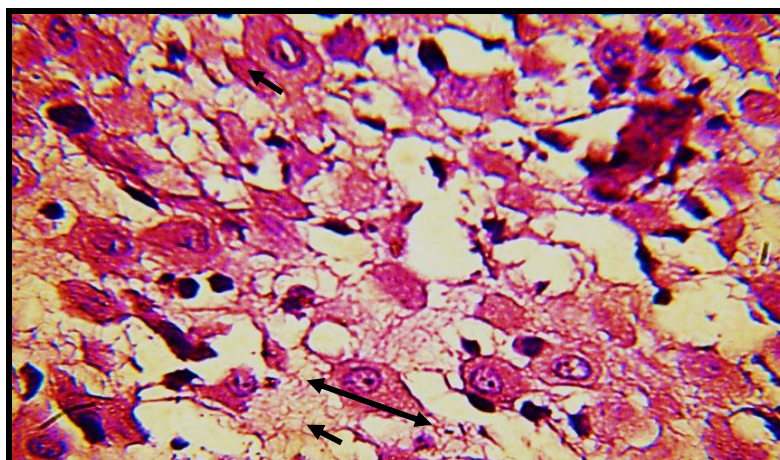


Figure (6): Histopathological section in the placenta of aborted women shows vacuolation in the decidual cell. There is intranuclear inclusion bodies (arrows) (H&E 40X).

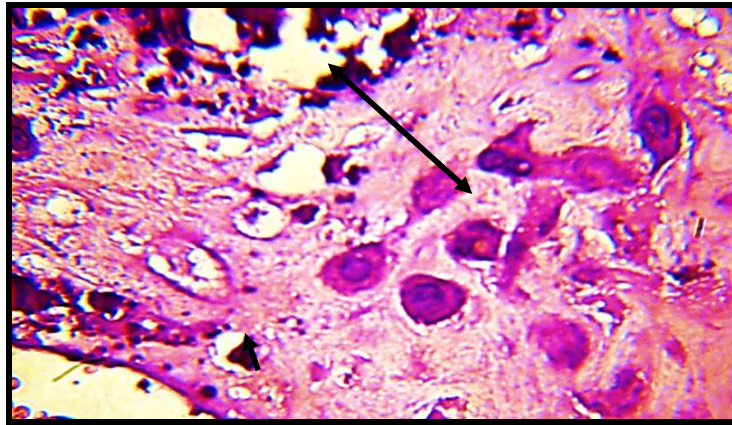


Figure (7): Histopathological section in the placenta of aborted women shows necrosis, congested blood vessels, calcium deposition in decidual area, and intracellular inclusion bodies in the decidual cells (arrows) (H&E 40X).

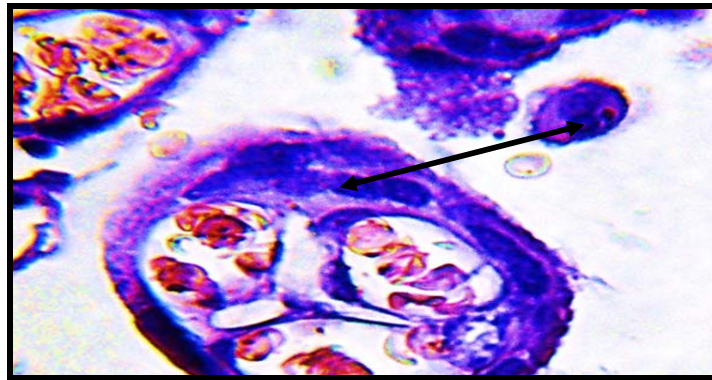


Figure (8): Histopathological section in the placenta of aborted women. There is a proliferation of cytotrophoblasts and inclusion body in the macrophage in the extra villous space (arrows) (H&E 40X).

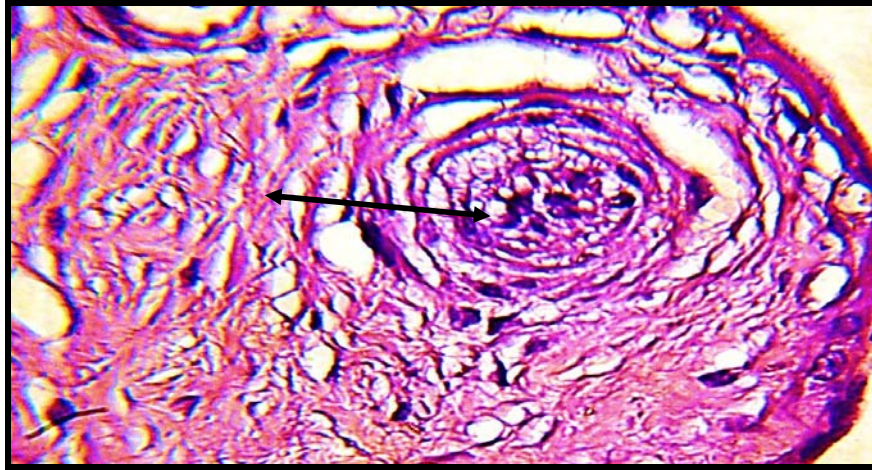


Figure (9): Histopathological section in the placenta of aborted women shows fibrosis of villus stroma, hyperplasia of endothelial lining cells and muscular hypertrophy of blood vessels (arrows) (H&E 40X).

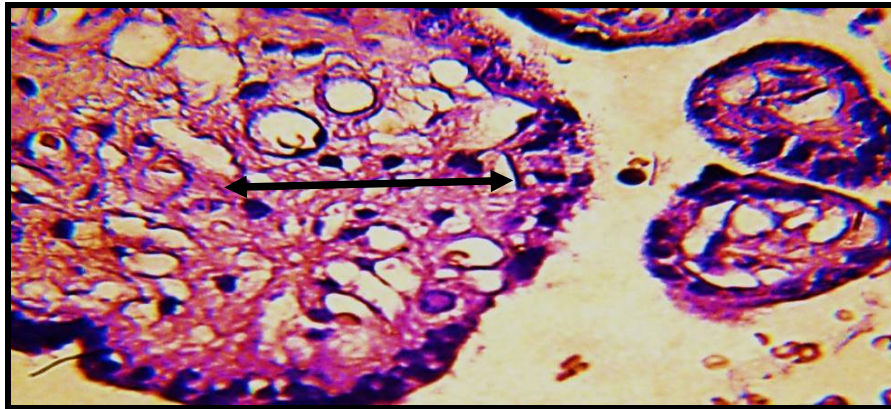


Figure (10): Histopathological section in the placenta of aborted women shows desquamation of cytotrophoblasts and edema of villus stroma (arrows) (H&E40X).

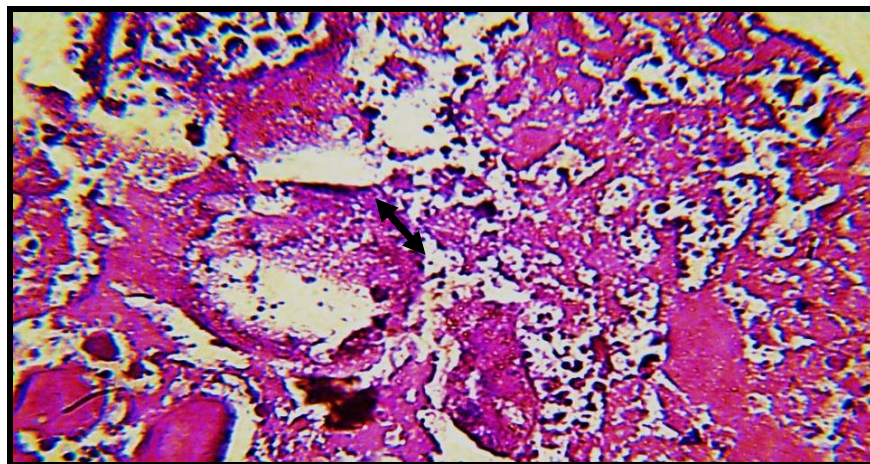


Figure (11): Histopathological section in the placenta of aborted women shows severe necrosis and neutrophil infiltration in chorionic plate (arrows) (H&E 40X).

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