Acute Erythroid Leukemia Causing Fetal Demise at 25 Weeks Without Associated Down Syndrome: A Case Report

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Introduction

Congenital leukemia (CL) is a rare entity, affecting approximately 1 in 5 million births; rarer still is congenital pure erythroid leukemia, with only a few cases described in the literature to date (1, 2, 3). Nearly all reported cases of congenital leukemia are associated with Down Syndrome; in general, patients with Down Syndrome are at a 20-fold increased risk of childhood leukemias (4). Here, we present a case of acute erythroid leukemia (AEL) diagnosed in the placenta of a 25-week stillborn fetus, negative for trisomy 13, 18, and 21 at time of prenatal screening and confirmed again on post-delivery karyotyping.

Case report

The mother of the 25-week stillborn fetus is a 22-year-old primigravid woman from Yemen with an unremarkable prenatal course and negative cell-free DNA screening. Following delivery, histologic examination of the placenta demonstrated marked infiltration of fetal vascular spaces by erythroid blasts including the umbilical cord, stem villi, and terminal villi, causing vascular occlusion and villous stromal karyorrhexis (Figure 1). Blast cells made up more than 95% of the intravascular cellularity with rare focal involvement of maternal spaces, likely due to physical manipulation of the specimen (Figure 1). Maternal complete blood count at time of delivery was within normal limits, making maternal metastatic leukemia to the placenta unlikely. The neoplastic cells were positive for erythroid markers including CD71, Glycophorin A, and E-cadherin, and negative for lymphoid markers (Figure 2).

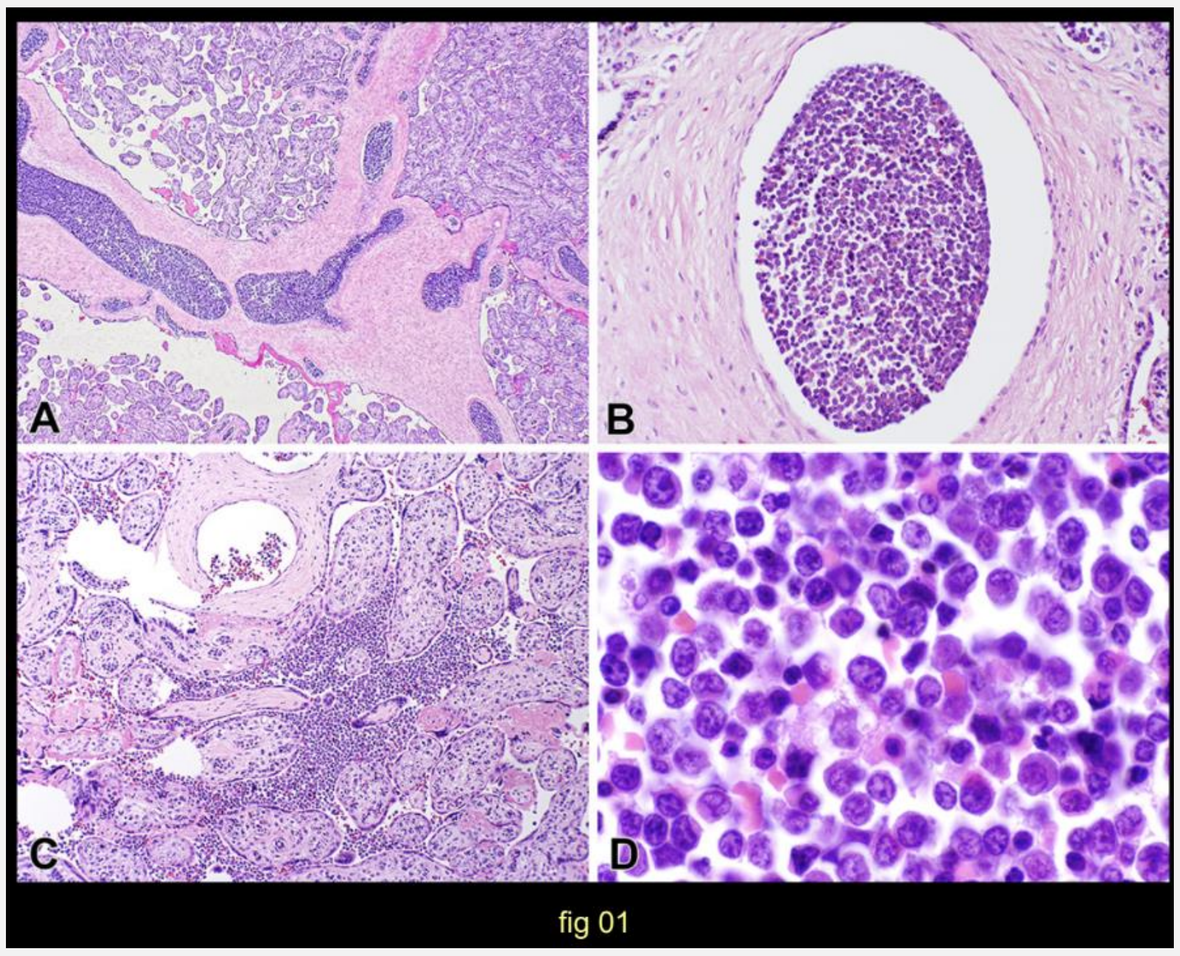

Figure 1: A. Placenta, H&E, 2x; B. Tumor cells in fetal vessels, H&E, 20x; C. Tumor cells in maternal space (artifact), H&E, 10x; D. Blast cells, H&E, 100x.

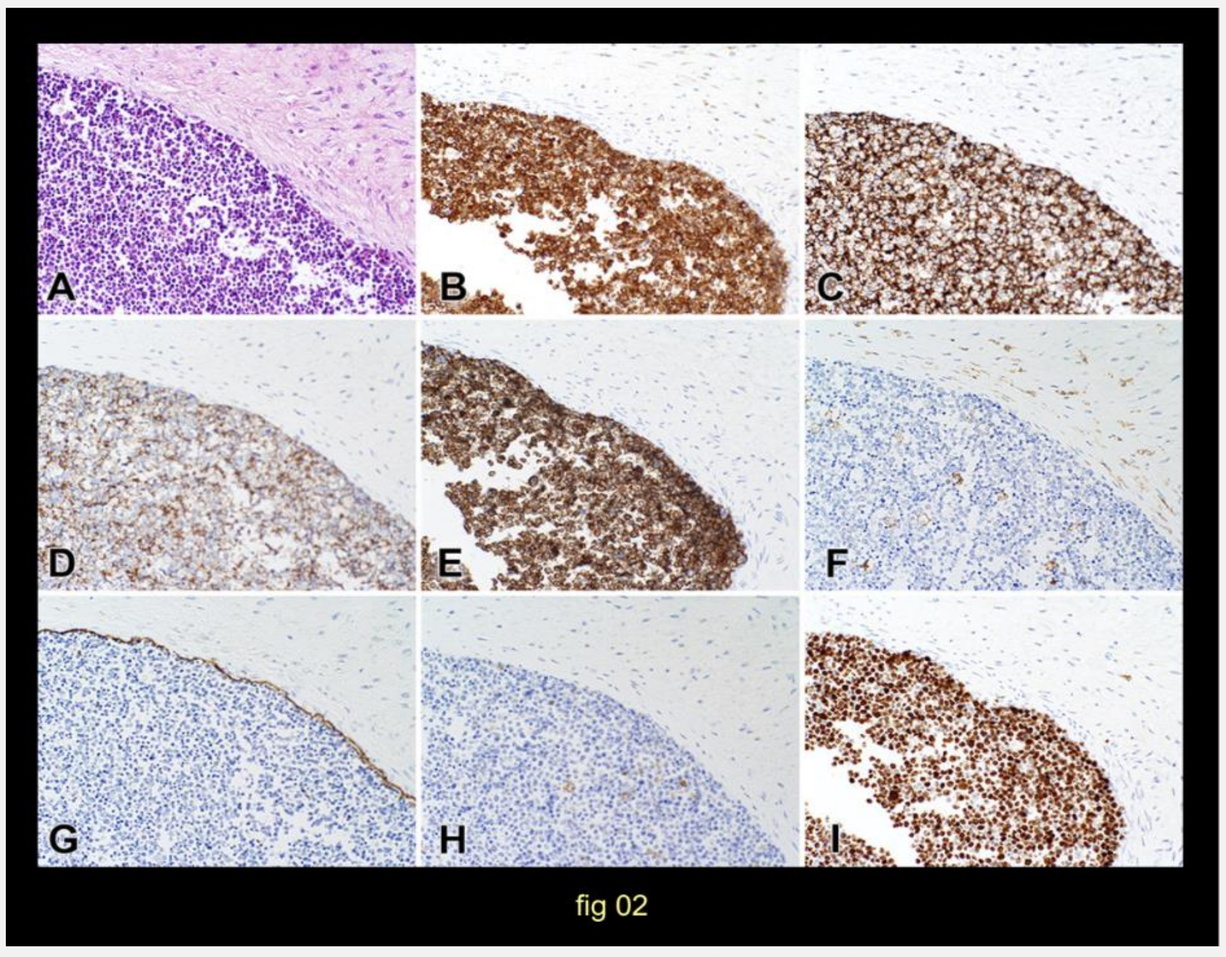

Figure 2: A. H&E, 20x; B. CD71, 20x; C. Glycophorin, 20x; D. ECadherin, 20x; E. CD43, 20x; F. CD45, 20x; G. CD34, 20x; H. CD117, 20x; I. Ki67, 20x.

Discussion and Conclusion

Data regarding incidence of placental involvement by congenital leukemia (CL) is limited to rare case reports (5). While the exact pathogenesis of CL has yet to be understood, commonly identified genetic and molecular alterations include trisomy 21 and rearrangements in the KMT2A gene. Other proposed etiologies include an inherited DNA mutation or syndrome (such as Li Fraumeni Syndrome), or by exposure to chemicals or radiation during pregnancy (6). Acute erythroid leukemia is a rare and aggressive subtype of myeloid leukemia, comprising 1% of all myeloid leukemias. The median age of presentation is 66-68 years of age, and median survival rate is <6 months. Common molecular alterations include TP53 overexpression, biallelic TP53 mutations, and complex karyotypes (7). Less is understood about AEL affecting the pediatric population. Our case demonstrates a wild-type TP53 expression pattern; however, it is hypothesized that a distinctly different pathogenesis occurs in pediatric patients with genetic features and molecular mechanisms yet to be elucidated. This unique case of congenital AEL in the absence of Down Syndrome may present new insight into pediatric hematopoietic neoplasms.

References

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