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Case Report

Extreme Gestational Discordance in Twins: A Probable Case of Superfoetation in a Resource-Limited Setting

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ABSTRACT

Background:

Superfoetation, defined as the fertilization of a second ovum and subsequent implantation of its conceptus during an ongoing pregnancy, is an exceedingly rare and controversial phenomenon in humans. Diagnostic challenges are particularly pronounced in resource-limited settings where access to early obstetric ultrasound and advanced investigations is limited.

Case presentation: A case of naturally conceived preterm twins delivered at 34 weeks gestation to a 28-year-old multiparous mother with severe pre-eclampsia. Marked anthropometric and gestational age discordance was observed; The male twin weighed 1600 g and a female twin 650 g and their gestational ages by clinical assessment using the New Ballard Score were respectively 35 and 27.2 weeks suggesting a difference in estimated gestational age of approximately eight weeks. The larger twin had a favourable clinical course, while the smaller twin developed complications of extreme prematurity and died on day 5 of life. Alternative explanations, including twin-to-twin transfusion syndrome and isolated intrauterine growth restriction, were considered unlikely.

Conclusion: The case suggests the clinical plausibility of superfoetation and emphasizes the importance of careful clinical evaluation in resource-limited settings. Improved awareness and diagnostic capacity are needed to better characterize and understand this rare phenomenon.

Keywords: Superfoetation, Fertilization, Case report, Twin pregnancy, Gestational age discordance

INTRODUCTION

Superfoetation is a rare and biologically intriguing reproductive phenomenon defined as a second conception occurring during an ongoing pregnancy, resulting in asynchronous foetal development within the same uterus.[1,2,3] It is distinct from superfecundation, which involves fertilization of multiple ova within the same ovulatory cycle, and from pathological causes of foetal discordance such as intrauterine growth restriction or twin-to-twin transfusion syndrome.[2,4] Although well established in certain animal species, its occurrence in humans remains highly controversial due to its rarity and the challenges associated with confirming its occurrence, with only few cases reported globally as of 2024 despite its initial description over three decades ago.[5] It is attributed to the failure of the normal physiological mechanisms that suppress ovulation during pregnancy, including progesterone-mediated inhibition of the hypothalamic–pituitary–ovarian axis, cervical mucus alterations, and decreased endometrial receptivity.[1,2] Emerging evidence suggests that assisted reproductive technologies (ART) may override these mechanisms, potentially increasing its occurrence.[5,6,7] In resource-constrained settings, where early gestational dating is often unavailable, diagnosis relies largely on postnatal clinical assessment. This report describes a case of markedly discordant twins attributed to superfoetation, contributing to the limited body of evidence supporting the plausibility of superfoetation in humans.

Consent to participate and ethics approval were obtained from the parent and health research ethics committee of the Abubakar Tafawa Balewa University Teaching Hospital (0025/2024).

Case Presentation A set of two-hour-old preterm twins were referred to the Special Care Baby Unit our hospital, Abubakar Tafawa Balewa University Teaching Hospital, following delivery at a peripheral facility. Delivery was via emergency caesarean section at an estimated gestational age of 34 weeks due to severe pre-eclampsia in a 28-year-old multiparous woman. The pregnancy was naturally conceived, with no history of assisted reproductive techniques or ovulation induction. The antenatal period was complicated by pregnancy-induced hypertension and severe anaemia requiring blood transfusion. A routine ultrasound performed at approximately 27.2 weeks' gestation confirmed a twin pregnancy. At birth, marked gestational age and anthropometric discordance was evident between the twins. Information about foetal sacs and placentae could not be obtained from the referring facility.

The first twin, a male, was low birth weight (LBW) and small for gestational age (SGA) with a birth weight of 1600 g, length of 41 cm, and occipitofrontal circumference (OFC) of 29 cm. Clinical assessment using the New Ballard Score estimated a gestational age of approximately 35 weeks. He was managed as a late preterm neonate with suspected early-onset sepsis and had a favourable clinical outcome and was discharged on day 6 of life. In contrast, the second twin, a female, had a birth weight of 650 g, length of 33 cm, and OFC of 23.5 cm. Clinical features were consistent with an extremely preterm neonate, with an estimated gestational age of approximately 27.2 weeks. The infant developed complications of extreme prematurity, including respiratory distress, hypothermia, and recurrent apnoea, and died on day 5 of life despite supportive care.

The approximately seven-week difference in estimated gestational age, supported by both

Anthropometric measurements and clinical maturity scoring were highly suggestive of asynchronous foetal development. A side-by-side comparison of the twins' clinical and anthropometric parameters is presented. in **table 1**, demonstrating the marked degree of discordance.

Table I: Side-by-Side Comparison of Twin Parameters

Variable	Twin 1 (Male)	Twin 2 (Female)	Difference
Birth weight (g)	1600 (LBW)	650 (ELBW)	950 g
Length (cm)	41	33	8 cm
OFC (cm)	29	23.5	5.5 cm
Estimated GA (weeks)	35	27.2	~8 weeks
Gestational category	Late preterm	Extremely preterm	—
Packed cell volume (%)	57	57	
Clinical condition	Stable	Critically ill	—
Specific supportive care received			
CPAP	No	Yes	
Surfactant	No	No	
Caffeine citrate	No	No	
KMC	Yes	No	
Nutritional support	Yes	Yes	
Outcome	Discharged (Day 6)	Died (Day 5)	

Alternative explanations—including twin-to-twin transfusion syndrome and isolated intrauterine growth restriction—were considered unlikely given the discordant sex, absence of classical clinical features, and magnitude of disparity. Chromosomal abnormalities could not be excluded due to lack of genetic testing. Photographic documentation further demonstrated striking phenotypic differences between the twins, with clear disparity in body size and physical maturity (Figures 1-3). Overall, the findings were suggestive of probable superfoetation. This case describes presentation of a probable superfoetation, a rare condition, characterized by marked and gestational age and anthropometric discordance in a naturally conceived twin. The approximately eight-week difference in estimated gestational age, supported by concordant clinical and anthropometric assessment, is more consistent with asynchronous conception than isolated intrauterine growth restriction. The magnitude of discordance observed in this case are central to the diagnostic significance. Unlike typical twin growth

abnormalities—where disparities often evolve progressively due to placental insufficiency—superfoetation is characterized by early-established and sustained differences in development. The magnitude of discordance demonstrated in Table 1 exceeds typical variations observed in twin pregnancies, further supporting asynchronous foetal development.

DISCUSSION

Figure 1: Bigger male twin 1

Figure 2: Smaller female twin 2

Figure 3: Both twins lying side by side

Similar patterns have been reported in antenatally diagnosed cases, where early gestational discordance remains consistent throughout pregnancy, reinforcing the likelihood of asynchronous conception rather than pathological growth variation.[8,9,10] Despite these observations, superfoetation in humans remains highly controversial. Physiological mechanisms during pregnancy, including progesterone-mediated suppression of ovulation, cervical mucus barriers, and reduced endometrial receptivity—make a second conception biologically unlikely.[1,2] These constraints have led some authors to attribute reported cases to alternative explanations such as severe discordance, delayed implantation, or growth restriction.[2] However, accumulating case reports demonstrating persistent

gestational discordance, separate developmental trajectories, and distinct placentation provide indirect but compelling evidence supporting its plausibility.[8,9,10] Globally, superfoetation remains extremely rare, with approximately 17 cases reported as of 2024, some associated with heterotopic pregnancies and assisted reproductive technologies (ART).[5,6,7] This association suggests that hormonal or procedural factors may occasionally override natural reproductive suppression mechanisms. However, its occurrence in spontaneous pregnancies, as observed in this case, indicates that such mechanisms may rarely arise naturally. The exact pathophysiological basis remains uncertain. Proposed mechanisms include breakthrough ovulation during early pregnancy, delayed implantation, and altered hormonal signalling—particularly involving human chorionic gonadotropin and oestrogen—which together may provide a plausible explanation for asynchronous conception despite established physiological constraints.[6,8]

Our case likely represents a natural form of superfoetation, as conception occurred spontaneously and no uterine abnormalities were reported, in contrast to cases associated with assisted reproductive technologies[5,6,7] or structural anomalies.[11] The diagnosis was made postnatally, reflecting limitations in antenatal imaging and expertise. Although an ultrasound performed at 28 weeks identified a twin pregnancy, the gestational discordance was not recognized, highlighting diagnostic challenges in resource-limited settings. Alternative explanations were carefully evaluated. Twin-to-twin transfusion syndrome was considered unlikely due to discordant sex, absence of characteristic clinical features such as pallor or plethora, and comparable packed cell volumes.[12] Placental insufficiency, although possible in the context of maternal pre-eclampsia, is unlikely to account for the magnitude of weight and gestational age disparity observed.[12]

Chromosomal abnormalities could not be excluded due to lack of genetic testing; however, the absence of dysmorphic features makes this less likely. Although additional diagnostic tools such as bone age or dental maturity assessment could have strengthened the diagnosis, these were not feasible due to resource constraints and the critical condition of the smaller twin. Previous studies have shown that such methods may estimate gestational age within a two-week margin of error.[13,14] Emerging technologies for gestational age estimation—including metabolomic profiling, skin reflectance, and machine learning algorithms—have demonstrated accuracy within ±1 week, but remain largely inaccessible in low-resource settings.[15,16] In this context, anthropometric assessment remains a reliable and practical tool, with findings in this case aligning with expected gestational age ranges.[4] The clinical implications of this case are significant. The poorer outcome of the smaller twin highlights the vulnerability associated with gestational asynchrony, particularly in extremely preterm neonates. This underscores the importance of early recognition, careful monitoring, and tailored neonatal care in

discordant twin pregnancies. From a broader perspective, this report contributes to the limited body of literature on superfoetation, particularly from low- and middle-income settings where underdiagnosis is likely. It highlights the need for improved access to early obstetric ultrasound, standardized diagnostic criteria, and systematic reporting of similar cases to better define the true incidence and clinical implications of this phenomenon.

CONCLUSION This case provides further clinical evidence supporting the plausibility of superfoetation in humans. While definitive confirmation remains challenging, the convergence of clinical findings, magnitude of discordance, and exclusion of alternative diagnoses strongly support asynchronous foetal development. Increased awareness, improved diagnostic capacity, and systematic reporting are essential to advance understanding of this rare phenomenon.

LIMITATION This report is limited by the lack of confirmatory diagnostic tools, including early ultrasound, genetic analysis, and radiological maturity assessment. As such, the diagnosis of superfoetation remains inferential.

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