Fetus in Feto: A Case Study with Explanation

Atindra Datta MBBS, MS, Ex Professor
Burdwan Medical College, West Bengal, India
E-mail: atin62@gmail.com

Abstract. A 13 year boy was operated (exploratory laparotomy) for unexplained pain abdomen and a live fetus was found attached to left kidney. It was explained to be a case of identical twin. In twins, the placental capillaries anastomose very intricately so that one fetus may draw more blood resulting to deprivation of blood supply to other fetus who may end up to no supply later. But it did not kill the deprived fetus, but remain arrested in the erstwhile embryonic stage. While remaining in extraperitoneal space the deprived fetus is joined by herniated intestines of healthy fetus in physiological hernia. Later when intestines return to abdominal cavity (by creating extra space in abdomen) of heathy fetus the stunted fetus accompany intestines and managed to reach within abdominal cavity of healthy baby.

Keywords: Fetus in Feto, Identical Twins, Gametogenesis, Zona Pellucida, Monochorionic monoamniotic twins, Twin to twin transfusion syndrome, Physiological hernia.

INTRODUCTION

It is a case history of a 13 year old boy suffering from pain abdomen intermittently and came to a surgeon in Kalna hospital, Burdwan district, West Bengal, India. After much investigations the surgeon was unsure and decided to exploratory laparatomy to find out the source of pain abdomen. To his amazement he discovered a live fetus attached to left kidney of the boy and that was moving intermittently. The surgeon severed the fetus and made announcement that a fetus was found within a male child and people of that area flocked to see the patient and the fetus. It is a biological wonder not only to general public but reporters reached too by observing public response and started to investigate. Burdwan Medical college is nearby and reporter of a popular daily reached to me to try to find out the explanation of this wonderful developmental anomaly.

I said it is a case of identical twin. The fetus found within the boy was nothing but his own brother, unfortunately arrested in that development stage due to disconnection of blood supply to its placenta. Since it is a case of identical twin, by simple body attachment it drew its nutrients to manage survival these 13 years (Identical twins can exchange body tissues with high rate of acceptance). However it remained stunted in growth due to devoid of direct blood supply at early stage when it was detached by placental supply and lost its growth factors to reach him. By keeping himself floating within embryonic fluids, he managed to survive as it did not pose any problem in blood/tissue typing.

MECHANISM OF DOING IDENTICAL TWINS

Till now I discussed the event by which it came to my notice. Now it’s time to go into the embryological steps which gave origin to this wonderful incidence of the case. The general body cells (somatic) contain 46 chromosomes out of them 44 are autosomes and 2 are sex chromosomes (XX for female or XY for male). If the chromosome number is more than 46 the baby is either diseased or not viable. For that, nature has arranged a reduction cell division (Meiosis) in testes or ovary. By this way we get mature male or female cells (22X or 22Y) to fuse each other to establish the 46 number. This 22X or 22Y numbered chromosomes cells are called gametes.

Male Gametogenesis

In the testis there are multiple partitioned compartments (300–600) called lobules which contain 2–3 seminiferous tubules having multiple sperm stem cells which undergo
series of mitotic divisions until it reaches to a large cell (16 miu diameter) known as primary spermatocyte. The meiosis starts in this stage. In the first meiotic division homologous (looking same) chromosomes pairs separate. So is the case of sex chromosomes. In male sex chromosomes are XY while in female XX. So at this stage one separated cell contain 22X and other 22Y. Immediately after second meiosis division starts and this 22X and 22Y becomes double and are known as spermatids. These spermatids are normal looking cells containing cell membrane with intracytoplasmic organelles like nucleus, golgi apparatus, mitochondria, centrosome with first and 2nd centriols. The seminiferous tubules contain in between stem cells another type of cells called sustanticular cells of Sertoli. These cells do a miracle. They actively engulf these spermatids and nurse them to become a motile cell. The Sertoli cells first pick up the nucleus and make it head, then take golgi apparatus to change it into a cap called acrosomic cap, take the first centriol to make neck, cytoplasm and mitochondrias are packed into a membranous bag called midpiece, the 2nd centriol generated nine pairs of elongated fibrils which are called tail. The whole structure is called spermatozoon and its pleural spermatozoa or popularly called sperms. With the help of contractility of tail and mitochondrial power house the sperms move forward and reaches uterine tubes from vagina where ejaculations are made.

Female Gametogenesis

Gametogenesis in female is much different than a male. Oogenesis in female is restricted till age around 45. Female baby is born with numbered Oocytes and they get exhausted at age 45. Female sex stem cells undergo mitosis at embryonic period and by age 5th fetal month all turned into primary Oocytes and get arrested until the age of 13 years (puberty). The arrested meiosis 1 will be completed by extruding homologous chromosomes in the form of expelling 1st polar body where only chromosomes are expelled with no cytoplasm. The resultant secondary Oocytes again at meiosis2 get arrested and normally expelled out during menstruation. The secondary Oocyte turned to mature Oocyte only once or twice in mother’s life when she becomes pregnant. There is an unique feature of the mature Oocyte’s outer covering, known as Zona Pellucida. The moment a sperm touches the zona pellucida and tries to penetrate, immediately a signal reaches to the arrested chromosomes which then completes the job of 2nd meiosis division and allows the incoming sperm to pierce zona pellucida so that both sided haploid (half) chromosomes can meet each other to establish 46 number. The event is called fertilisation.

ZONA PELLUCIDA

It is a thickened membrane of the mature Oocyte. That has sensor so that when a incoming sperm touches it to penetrate it sends signal inside. After the sperm penetration occurs, a chemical change takes place within its substance so that it becomes impermeable to further entry of sperms. This is called Zonal reaction. The acrosomic cap of the sperm contains many enzymes. Hyaluronidase dissolves the corona radiata cells still remained attached outside the mature oocyte and give passage to sperm. The acrosomic cap contains Neuraminidase another enzyme that helps the sperm head to penetrate corona radiata. Other parts of the structure of spermatozoon remains outside, only the head means nucleus is allowed to pass in.

The chemical change that hardened the Zona is an unique phenomenon. It did 2nd sperm onwards impermeable. This is a protective character of Zona. However the degree of hardening occurs on the substance of the Zona differs from case to case. This hardening prevents multiple sperm entry but sometimes it becomes so hard that Zonal dissolution is not at same time in every case. As a result blastomeres (dividing cells from fertilised egg) are not released in time. The blastomeres have time bound genetic code to unfold its development may be arrested or abnormality sets in.

Sometimes a small crack appears in Zona and hungry blastomeric cells in the form of a cavity tries to herniate out through that small crack pore on Zona. When it wholly comes out, the process causes a jerk by compression to sudden widened cavity formation. That makes the ICM (INNER CELL MASS) splits. The splitting may be 2 to 8. This results in formation of 2 to 8 monozygotic babies. This is the mechanism of twinning. So far in the world octaplates is the highest number of twins reported.

Twins

![Image of Zona Pellucida and Twins](https://via.placeholder.com/150)

**Dichorionic Diamniotic (fused placenta)**

**TTTS Pregnancies**
A: 0–4 days. If the release of blastomeric cavity is delayed by 4 days the picture shows two fetus with their own separate placenta and completely separated by amniotic cavities.

B: 5–8 days. If the release of blastomeric cavity is delayed by 8 days then there will be a single placenta serving both feti but feti are separated by amniotic cavities.

C: 9–12 days. If the release of blastomeric cavity is delayed by 12 days then there will be single placenta serving both feti and single amniotic cavity lodging both feti with no membrane interposed in between.

D: If the release of blastocyst cavity is delayed more than 12 days then there is high chance of conjoint twins as they stay within a hard pressed small cavity and body parts of one baby accept other babies parts to fuse easily. This feature has been reported in cranium, thorax, abdomen, and buttock. The picture is taken from Langman’s Medical Embryology, Wolters Kluwer, 2021.

**MECHANISM OF FETUS IN FETO (HOW A BABY ENTERS INSIDE THE OTHER BABY)**

**Twin to Twin Transfusion Syndrome**

When there is monochorionic (single placenta) twins, this syndrome may occur. In this case bacause of highly developing fetal tissues, blood capillaries have a tendency to communicate with each other placenta. This results in a network of capillaries that may channelise more blood to one fetus than the other or in more rare case completely deprive blood flow to the other fetus. If blood never reaches so no nourishment reaches and no conduction of developmental factors which is crucial for unfolding of body’s different systemic growth. However, the stunted baby will not die. The two babies are made up of same tissue so simple attachment in any body part can derive some nutrients by percolation sufficient to live a life but development will be arrested at that stage of embryological milestone.

So It may be deduced that twin to twin transfusion syndrome can completely deprive blood supply and results in one full blown baby while the other is arrested in a miniscule shape attached anywhere with his/her brother/sister body parts. Another determinant is that it should be case of monochorionic and monoamniotic twins.

In case of conjoint twins, the two babies are well developed but may be fused in buttock, abdomen, chest or head respectively. So it may be deduced that it is not a case of monochorionic means they have their own separate placentas but a case of monoamniotic so no barrier existed inbetween them and two babies were in contact with body parts which got fused by staying long in same position within a tight amniotic cavity.

**How the 2nd Fetus Managed to Enter the 1st?**

In the outset I described a small baby was found within the abdomen of a grown up male boy and was attached to left kidney.

To understand this problem we note that in a case of monochorionic and monoamniotic twins there is no barrier existed in between and one baby was fully grown up while other was arrested in growth due to twin to twin transfusion syndrome.

**Physiological Hernia**

The sudden and rapid growth of liver in a small abdominal cavity makes the contents very much pressurised and movable organs are intestines who moves out of abdomen via umbilicus. So at this stage, in the same amniotic cavity not only the herniated intestines lodge but that stunted fetus existed too. However after 10 the week liver growth ceased and development abdominal cavity size increased. Intra-abdominal pressure drops and intestines started returning. To be noted that Liver occupied the right and upper part of abdomen. So the returning intestines cannot stay in the occupied area by liver, they occupy left and lower part of abdomen. Along with the returning intestines accompanied by the small fetus in the lower left side of the abdomen.
ASCENT OF KIDNEYS

Kidneys are developed in pelvic cavity and later ascend up in abdominal cavity along posterior wall until stopped by Suprarenal glands. Since the left kidney came directly in contact by push up, the fetus got attached to it and remained there for 13 years.

REFERENCES