EJPMR, 2026, 13(3), 184-190 **Case Study** **Impact Factor: 8.158**

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

ISSN (O): 2394-3211
ISSN (P): 3051-2573
Coden USA: EJPMAG

CONCEPTUAL AND CLINICAL EVALUATION OF *BEEJABHAVA* DUSHTI IN A CASE OF *ANASTHI GARBHA* i.e. NEURAL TUBE DEFECT: A CASE STUDY

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How to cite this Article: Dr. Pratiksha Godbole*[1], Assoc. Prof. (Dr.) Reetu Pandey[2], Ass. Prof. (Dr.) Meenakshi Singh[3]. (2026). Conceptual and Clinical Evaluation of Beejabhava Dushti in A Case of Anasthi Garbha i.e. NEURAL Tube Defect: A Case Study. European Journal of Biomedical and Pharmaceutical Sciences, 13(3), 184–190.

Article Received on 26/01/2026 **Article Revised on 16/02/2026** **Article Published on 01/03/2026**

ABSTRACT

Anasthi garbha is one of the most misunderstood and misinterpreted concept of *Ayurved*. In *Ayurveda* is described as a congenital condition arising from *Beejabhava Dushti*, particularly involving defective development of the *Asthi Dhatu*. *Anasthi garbha* is a term used in *Ayurvedic* embryology to describe a fetus formed without bones as a result of a sexual act between two females. *Anasthi garbha* is reporting of a rare incidence of birth of a child with skeletal dysplasia. It is not a boneless fetus but fetus with less and soft bones (dysostosis and osteochondrodysplasias).यदा नार्यावुपेयातां वृषस्यन्त्यौ कथञ्चन । मुञ्चतः शुक्रमन्योऽन्यमनस्थिस्तत्र जायते ।।(सु० सं० शा० २/४७ एवं भा० प्र० पूर्व० ३/५७ व १८७)*Strishukra* is considered responsible for this notion. This misunderstanding requires clarity. As *Acharya Arunadatta* in his commentary on *Ashtang Hrudhaya* says that Union male gamete with female gamete would only result in conception. Parthenogenesis normally does not occur in humans. Here the embryo develops from an ovum after duplication of maternal genome. There is no paternal genome in such embryos. Neural tube defects are major congenital anomalies resulting from failure of proper neural tube closure during early embryogenesis, leading to conditions such as spina bifida and anencephaly. Neural tube defects (NTDs) are a group of birth defects in which an opening in the spine or cranium remains from early in human development. When the neural tube does not close completely, an NTD develops. Specific types include: spina bifida which affects the spine, anencephaly which results in little to no brain, encephalocele which affects the skull, and iniencephaly which results in severe neck problems. NTDs are one of the most common birth defects, affecting over 300,000 births each year worldwide. Anencephaly is a severe, lethal, neural tube defect characterized by the partial or total absence of the brain and calvarium, with a 100% mortality rate either in utero or shortly after birth. It occurs when anterior neuropore fails to close between 23-26 days post-conception, affecting approximately 1 per 1,000 births and is associated with genetic and environmental risk factors such as maternal diabetes, obesity, toxin exposure, and folate deficiency. In fact Polydactyly associated with neural tube defects usually indicates a syndromic congenital anamoly, often with genetic or chromosomal etiology.

KEYWORDS:- *Anasthi Garbha*, Neural Tube Defect, Anencephaly, Enecephalocele, Spina Bifida, Neuropore, *Asthi Dhatu*.

INTRODUCTION

Congenital anomalies remain a significant cause of perinatal morbidity and mortality worldwide, with neural tube defects (NTDs) being among the most common and severe developmental disorders of the central nervous system. These defects arise due to failure of proper

neural tube closure during early embryogenesis and may result in conditions such as spina bifida, anencephaly, and encephalocele. The etiology of neural tube defects is multifactorial, involving genetic factors, nutritional deficiencies—particularly folate deficiency—and adverse maternal and environmental influences during the early stages of pregnancy.

दोषाभिघातैर्गर्भिण्या यो यो भागः प्रपीड्यते।सस भागः शिशोस्तस्य गर्भस्थस्य प्रपीड्यते ।।(सु.शा ३/१७)

Acharya Sushruta states that when a pregnant woman is affected by aggravated *doshas*, the particular part of her body that is afflicted by these *doshas* exerts a similar adverse effect on the corresponding part of the fetus while it is in the womb. As a result, the same organ or structure of the developing fetus becomes compressed, weakened, or abnormally developed. This suggests that the physiological and pathological relationship between the mother and the fetus, emphasizing that disturbances in the mother's body—especially due to vitiated *doshas*—can directly influence fetal growth and lead to congenital abnormalities. It underlines the importance of maintaining doshas balance in the mother throughout pregnancy to ensure normal and healthy development of the fetus.

Ayurveda provides a detailed description of embryological development under the concept of *Garbha Sharira*, emphasizing the role of *Beeja*, *Beejabhaga*, and *Beejabhagavayava* in the formation of a healthy fetus. Any disturbance in these factors leads to *Beejabhava Dushti*, resulting in various congenital abnormalities collectively termed *Garbha Vikriti*. Among these, *Anasthi Garbha* is described as a condition characterized by improper or absent development of *Asthi Dhatu*, which forms the structural framework of the body and provides protection to vital organs. From an *Ayurvedic* perspective, Impairement in *Asthi* formation during *Garbhavastha* may contribute to abnormal development of structure derived from *Asthi* and *Majja dhatu*, which are closely associated with the nervous system.

Asthi and *Majja Dhatu* are closely interrelated in *Ayurveda*, and *Majja* is considered functionally associated with the nervous system. Hence, defects in *Asthi* formation during intrauterine life may influence the normal development of neural structures. This conceptual understanding offers an *Ayurvedic* perspective for explaining certain skeletal and neural malformations comparable to neural tube defects described in modern medicine.

Exploring the relationship between *Anasthi Garbha* and neural tube defects helps in establishing a meaningful correlation between classical *Ayurvedic* concepts and contemporary embryology. Such an integrative approach not only enhances conceptual understanding but also highlights the importance of preconceptional care, proper maternal nutrition, and adherence to antenatal regimens in the prevention of congenital anomalies.

AIM AND OBJECTIVES: To study a case of Neural Tube Defect (NTD) in the light of *Ayurvedic* concepts, specifically correlating it with *Anasthi Garbha* mentioned in classical texts, and to analyse its relevance in modern embryology and teratology.

To review the Ayurvedic concept of *Anasthi Garbha* with reference to its etiological factors (*Beeja*, *Beejabhaga*, *Beejabhagavayava dushti*).

CASE REPORT

The present case study represents *Ayurvedic* correlation with NTD. The 28 years old female patient visited the OPD of P.G. Department of *Prasuti Tantra Evum Stree Roga* on regular ANC checkup at R.D.M.C, Bhopal.

CHIEF COMPLAINTS

- Amenorrhea since 4 months.
- Nausea and vomiting on and off
- Weakness

HISTORY OF PRESENT ILLNESS: The patient had above complaints for the last 3-4 months. In this period, she experienced vomiting, nausea and sometime morning sickness. Also, had an itching over abdomen.

History: A 28-year-old female, G3P2L2A0, came for routine antenatal care (ANC) visits. Her first two visits were uneventful with no significant complaints. On her third ANC visit, routine ultrasonography (USG) revealed features suggestive of acrania. She was referred for a repeat targeted USG at a higher center, which confirmed the findings and showed progression to exencephaly**.**

PERSONAL HISTORY

Name- XYZ	*Bala- Avar* (poor)
Prakriti- Vatajpitaj	Age- 28 years
Sleep- Adequate	B.P.-110/70mmHg
Sex- Female	P.R.-74/min
Marital Status- Married	Bowel Habit- Regular
Height- 154cm	Occupation- House Wife
Appetite- Normal	Weight- 57.2 kg

ASHTAVIDHA PARIKSHA

Nadi (Pulse)- 74/min	*Shabda* (Speech)- Clear
Mala (Stool)- *Niram*	*Sparsh* (Touch)- Clear
Mutra (Urine)- *Samyak*	*Druk* (Eyes)- *Prakrut*
Jivha (Tongue)-*Saam*	*Aakriti* (Built)- *Madhyam*

DISCUSSION

Anasthi Garbha, described in *Ayurveda* as defective development of *Asthi Dhatu* due to *Beejabhava Dushti* and imbalance of *doshas*, can be conceptually correlated with neual tube defects described in modern medicines. Neural Tube defects involve malformations of the vertebral column and central nervous system, which correspond to *Asthi* and *Majja Dhatu*. Classical *Ayurvedic* texts explain that maternal *doshic* disturbances affect the corresponding fetal organs, supporting the role

of maternal factors in congential anomalies. Vitiation of *Vata Dosha* and inadequate maternal nutrition during early pregnancy may impair *Asthi* and *Majja* development, leading to structural and neural defects. Although not anatomically identical, *Anasthi Garbha* provides an *Ayurvedic* framework to understand neural tube defects and highlights the importance of preventive measures such as preconception care, balanced nutrition, and proper antenatal regime.

Steroid 5-α-reductase type 2 deficiency-It is also referred to as familial incomplete male pseudohermaphroditism type 2 or pseudovaginal perineoscrotal hypospadias, arises from a defect in androgen activity at the level of target tissues. In affected individuals, testosterone production and regression of Müllerian structures occur normally, but proper male phenotypic development is inadequate due to impaired androgen effect. The enzyme 5-α-reductase plays a crucial role by converting testosterone into dihydrotestosterone (DHT), a hormone essential for masculinization of the male fetus and for the growth and differentiation of androgen-dependent organs such as the prostate.

17β-Hydroxysteroid Dehydrogenase-3 (17β-HSD-3) Deficiency-It is an autosomal recessive condition caused by a defect in the final step of testosterone production. It is considered the most frequent enzymatic abnormality affecting testosterone synthesis. Individuals with a 46, XY karyotype typically present with a female external phenotype. The characteristic findings include:

- A blind-ending vagina
- Absence of Mullerian structures
- Testes located in the inguinal canal or abdomen
- Well-developed Wolffian duct derivatives, indicating some degree of virilization

During puberty, affected individuals often experience virilization, such as enlargement of the phallus and increased facial and body hair, along with a variable degree of feminization. In untreated cases, a shift in gender role or behavior from female to male may occur at puberty. Fertility has not been documented in individuals with this condition. *Beejabhavavyava* is conceptually related to 17β-hydroxysteroid dehydrogenase-3 deficiency. In *Ayurveda*, *beeja* denotes the reproductive seed and *beejabhava* refers to the specific components within the *beeja* responsible for proper formation of organs and characteristics; *beejabhavavyava* signifies a defect in these components leading to abnormal development. Similarly, in 17β-HSD-3 deficiency, a congenital enzymatic defect impairs the final step of testosterone synthesis in a 46, XY individual, resulting in abnormal sexual differentiation despite a male chromosomal pattern. This leads to a female or ambiguous phenotype at birth with virilization occurring at puberty. Thus, both concepts explain a developmental abnormality originating at conception, where an inherent defect manifests later as disordered sexual development and secondary sexual characteristics. Another possibility is that a new mutant dominant gene in the developing embryo results in formation of *Anasthi Garbha*.

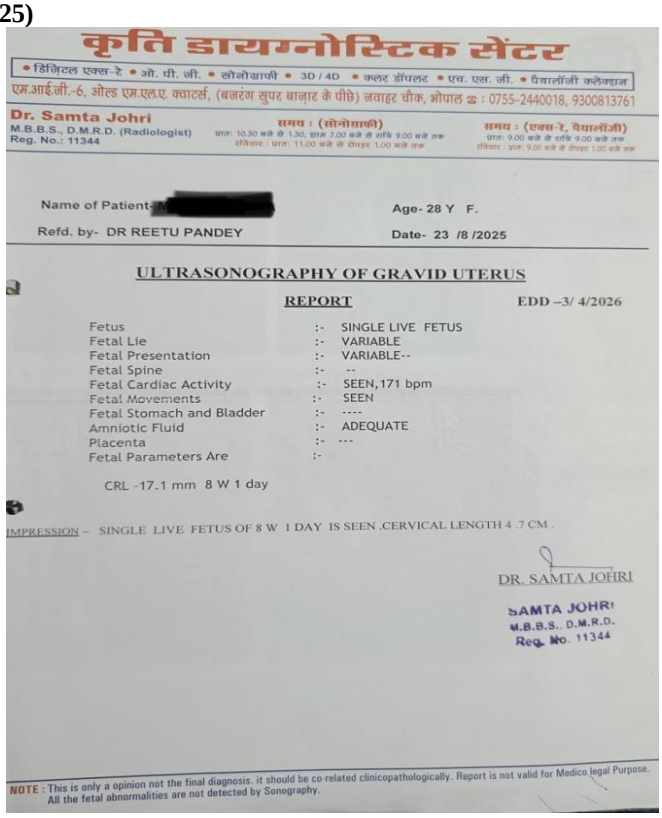
The condition can be diagnosed early in pregnancy, usually between the 11th and 14th weeks of pregnancy, by USG identifying the lack of cranial ossification and failure to measure the biparietal diameter and also detection through maternal serum alpha-fetoprotein levels. Early diagnosis is essential for effective management and counselling, particularly because of the high likelihood of pregnancy termination due to the fatal prognosis.

Polydactyly may be associated with neural tube defects when both occur as part of a broader congenital or syndromic anamoly rather than as isolated defects. This associated arises due to disturbances in early embryogenesis, particularly during the 3^{rd} -4^{th} weeks of gestation, when neural tube closure and limb bud development take place simultaneously. Genetic mutation, chromosomal abnormalies, defective signalling pathways such as Sonic Hedgehog, and impaired folate metabolism can disrupt both neural and limb development. Clinically, the coexistence of polydactyly and neural tube defects is commonly observed in syndromes and trisomy 13, where central nervous system malformations coexit with limb anomaies. The presence of polydactyly in a fetus with a neural tube defect should therefore prompt evaluation for syndromic or genetic causes and warrant detailed imaging and genetic counselling.

INVESTIGATION

- **Ultrasound** (USG) -is a key tool in the diagnosis of neural tube defects (NTDs) during pregnancy. It is through NTNB scan or through Target Scan which is typically performed during the second trimester, around 18–22 weeks, as part of routine prenatal screening. High-resolution ultrasound can detect structural abnormalities in the brain and spine, such as spina bifida, anencephaly, or encephalocele. In cases like spina bifida, USG may show signs such as a lemon-shaped skull or a banana-shaped cerebellum. For anencephaly, the absence of the skull and upper brain structures is clearly visible, the orbits are prominently visualized and directed upwards, giving the appearance that the fetus is ‘looking at the sky’called as Star gazing sign. Early detection through ultrasound allows for better parental counselling, further diagnostic testing, and informed decision- making about pregnancy management.

- **USG(Early scan-23/08/25)**



कृति डायग्नोस्टिक सेंटर

• डिजिटल एक्स-रे • ओ. पी. जी. • सोनोग्राफी • 3D / 4D • कलर डॉपलर • एच. एस. जी. • पैथालॉजी कलेक्शन

एम.आई.जी.-6, ओल्ड एम.एल.ए. क्वार्टर्स, (बजरंग सुपर बाज़ार के पीछे) जवाहर चौक, भोपाल ☎ : 0755-2440018, 9300813761

Dr. Samta Johri
M.B.B.S., D.M.R.D. (Radiologist)
Reg. No.: 11344

समय : (सोनोग्राफी) प्रातः 10.30 बजे से 1.30, सायं 7.00 बजे से रात्रि 9.00 बजे तक
रविवार : प्रातः 11.00 बजे से दोपहर 1.00 बजे तक

समय : (एक्स-रे, पैथालॉजी) प्रातः 9.00 बजे से रात्रि 9.00 बजे तक
रविवार : प्रातः 9.00 बजे से दोपहर 1.00 बजे तक

Name of Patient: [redacted] Age- 28 Y F.

Refd. by- DR REETU PANDEY Date- 23 /8 /2025

ULTRASONOGRAPHY OF GRAVID UTERUS

REPORT EDD –3/ 4/2026

Fetus	:-	SINGLE LIVE FETUS
Fetal Lie	:-	VARIABLE
Fetal Presentation	:-	VARIABLE--
Fetal Spine	:-	--
Fetal Cardiac Activity	:-	SEEN,171 bpm
Fetal Movements	:-	SEEN
Fetal Stomach and Bladder	:-	----
Amniotic Fluid	:-	ADEQUATE
Placenta	:-	---
Fetal Parameters Are	:-	

CRL -17.1 mm 8 W 1 day

IMPRESSION – SINGLE LIVE FETUS OF 8 W 1 DAY IS SEEN .CERVICAL LENGTH 4 .7 CM .

DR. SAMTA JOHRI

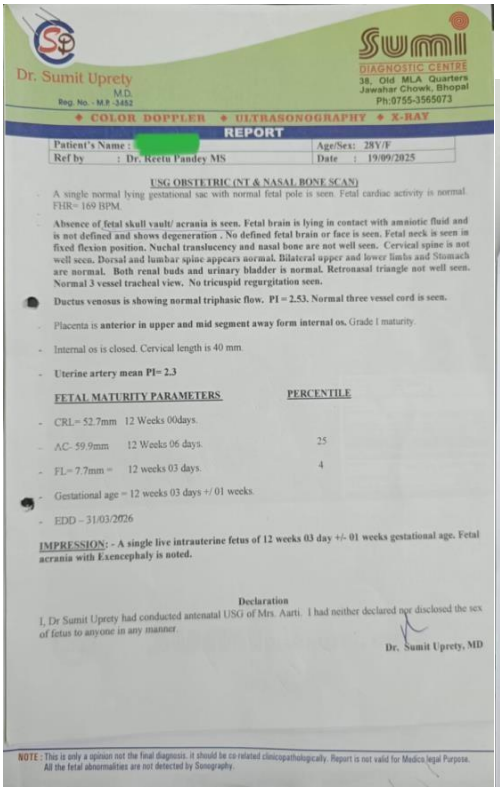
SAMTA JOHRI
M.B.B.S., D.M.R.D.
Reg. No. 11344

NOTE : This is only a opinion not the final diagnosis. it should be co-related clinicopathologically. Report is not valid for Medico legal Purpose. All the fetal abnormalities are not detected by Sonography.

- Single live fetus of 8 weeks 01 day is seen, FHR-171 BPM

2. USG (Routine scan 19/09/25)

- A single normal lying gestational sac with normal fetal pole, FHR-169BPM
- No defined fetal brain or face is seen
- Neck is seen fixed flexion position
- Cervical spine is not well seen
- Gestational age 12 weeks 03 days
- Fetal acrania with Exencephaly is noted



Dr. Sumit Uprety
M.D.
Reg. No. - M.P. -3482

Sumit
DIAGNOSTIC CENTRE
38, Old MLA Quarters
Jawahar Chowk, Bhopal
Ph:0755-3565073

• COLOR DOPPLER • ULTRASONOGRAPHY • X-RAY

REPORT

Patient's Name	: [redacted]	Age/Sex:	28Y/F
Ref by	: Dr. Reetu Pandey MS	Date	: 19/09/2025

USG OBSTETRIC (NT & NASAL BONE SCAN)

- A single normal lying gestational sac with normal fetal pole is seen. Fetal cardiac activity is normal. FHR= 169 BPM.
- **Absence of fetal skull vault/ acrania is seen. Fetal brain is lying in contact with amniotic fluid and is not defined and shows degeneration . No defined fetal brain or face is seen. Fetal neck is seen in fixed flexion position. Nuchal translucency and nasal bone are not well seen. Cervical spine is not well seen. Dorsal and lumbar spine appears normal. Bilateral upper and lower limbs and Stomach are normal. Both renal buds and urinary bladder is normal. Retronasal triangle not well seen. Normal 3 vessel tracheal view. No tricuspid regurgitation seen.**
- **Ductus venosus is showing normal triphasic flow. PI = 2.53. Normal three vessel cord is seen.**
- Placenta is **anterior in upper and mid segment away form internal os.** Grade I maturity.
- Internal os is closed. Cervical length is 40 mm.
- **Uterine artery mean PI= 2.3**

FETAL MATURITY PARAMETERS		PERCENTILE
CRL= 52.7mm	12 Weeks 00days.	
AC- 59.9mm	12 Weeks 06 days.	25
FL= 7.7mm =	12 weeks 03 days.	4
Gestational age = 12 weeks 03 days +/ 01 weeks.		
EDD – 31/03/2026		

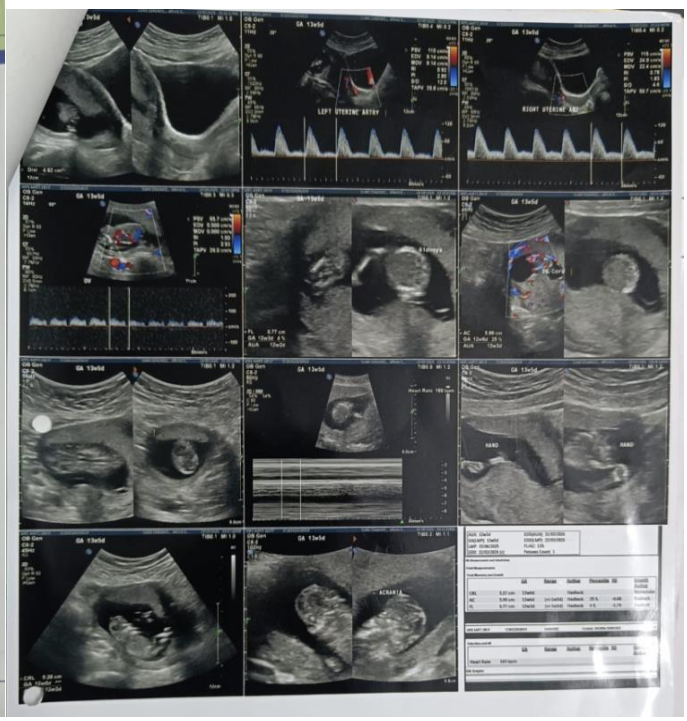
IMPRESSION: - A single live intrauterine fetus of 12 weeks 03 day +/- 01 weeks gestational age, Fetal acrania with Exencephaly is noted.

Declaration

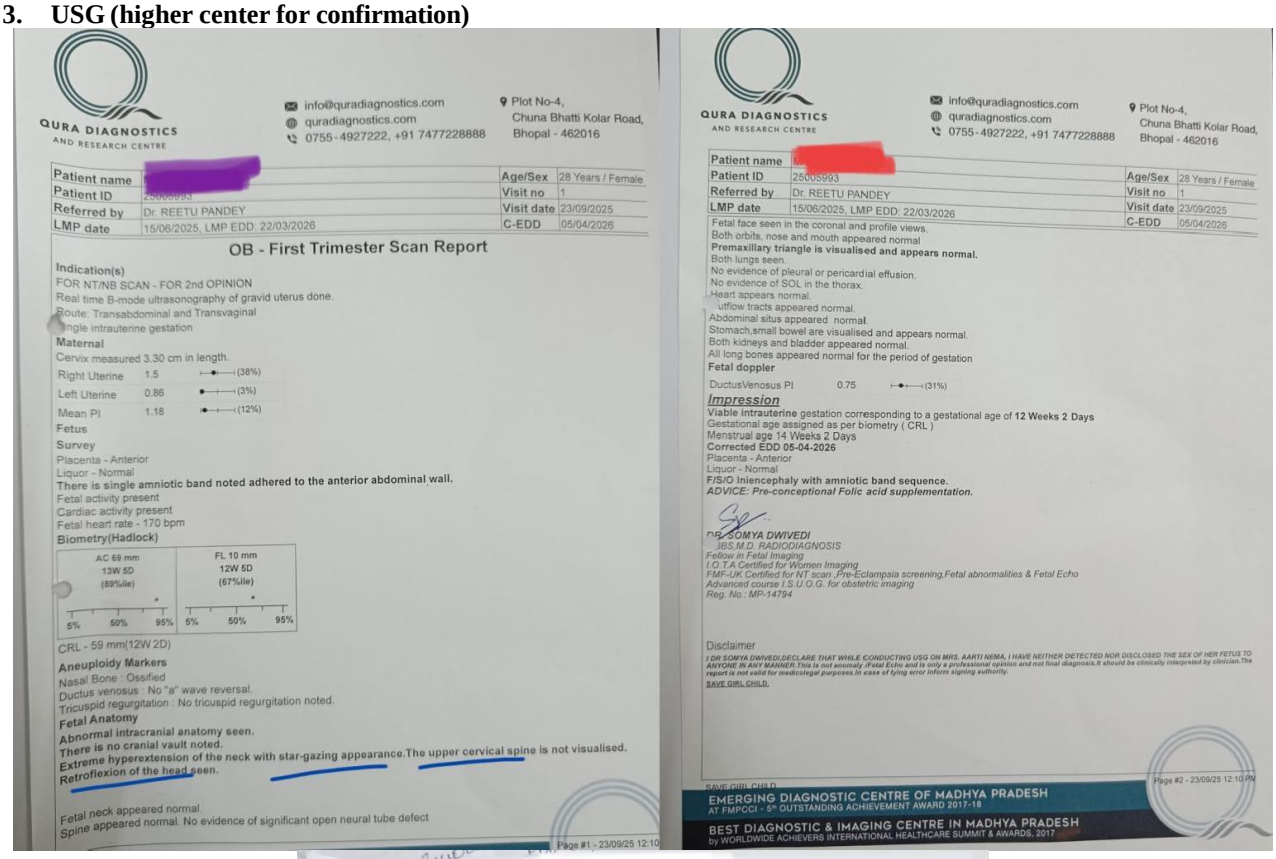
I, Dr Sumit Uprety had conducted antenatal USG of Mrs. Aarti. I had neither declared nor disclosed the sex of fetus to anyone in any manner.

Dr. Sumit Uprety, MD

NOTE : This is only a opinion not the final diagnosis. it should be co-related clinicopathologically. Report is not valid for Medico legal Purpose. All the fetal abnormalities are not detected by Sonography.



3. USG (higher center for confirmation)



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Plot No-4, Chuna Bhatti Kolar Road, Bhopal - 462016

Patient name	[redacted]	Age/Sex	28 Years / Female
Patient ID	25005993	Visit no	1
Referred by	Dr. REETU PANDEY	Visit date	23/09/2025
LMP date	15/06/2025, LMP EDD: 22/03/2026	C-EDD	05/04/2026

OB - First Trimester Scan Report

Indication(s)
FOR NT/NB SCAN - FOR 2nd OPINION
Real time B-mode ultrasonography of gravid uterus done.
Route: Transabdominal and Transvaginal
Single intrauterine gestation

Maternal
Cervix measured 3.30 cm in length.

Right Uterine	1.5	(38%)
Left Uterine	0.86	(3%)
Mean PI	1.18	(12%)

Fetus

Survey
Placenta - Anterior
Liquor - Normal
There is single amniotic band noted adhered to the anterior abdominal wall.
Fetal activity present
Cardiac activity present
Fetal heart rate - 170 bpm

Biometry(Hadlock)

AC 69 mm	FL 10 mm
13W 5D	12W 5D
(89%ile)	(67%ile)
5% 50% 95%	5% 50% 95%

CRL - 59 mm(12W 2D)

Aneuploidy Markers
Nasal Bone : Ossified
Ductus venosus : No "a" wave reversal.
Tricuspid regurgitation : No tricuspid regurgitation noted.

Fetal Anatomy
Abnormal intracranial anatomy seen.
There is no cranial vault noted.
Extreme hyperextension of the neck with star-gazing appearance.The upper cervical spine is not visualised.
Retroflexion of the head seen.

Fetal neck appeared normal.
Spine appeared normal. No evidence of significant open neural tube defect

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Plot No-4, Chuna Bhatti Kolar Road, Bhopal - 462016

Patient name	[redacted]		
Patient ID	25005993	Age/Sex	28 Years / Female
Referred by	Dr. REETU PANDEY	Visit no	1
LMP date	15/06/2025, LMP EDD: 22/03/2026	Visit date	23/09/2025
		C-EDD	05/04/2026

Fetal face seen in the coronal and profile views.
Both orbits, nose and mouth appeared normal
Premaxillary triangle is visualised and appears normal.
Both lungs seen.
No evidence of pleural or pericardial effusion.
No evidence of SOL in the thorax.
Heart appears normal.
Utflow tracts appeared normal.
Abdominal situs appeared normal.
Stomach,small bowel are visualised and appears normal.
Both kidneys and bladder appeared normal.
All long bones appeared normal for the period of gestation

Fetal doppler

DuctusVenosus PI	0.75	(31%)

Impression
Viable intrauterine gestation corresponding to a gestational age of **12 Weeks 2 Days**
Gestational age assigned as per biometry (CRL)
Menstrual age 14 Weeks 2 Days
Corrected EDD 05-04-2026
Placenta - Anterior
Liquor - Normal
F/S/O Iniencephaly with amniotic band sequence.
ADVICE: Pre-conceptional Folic acid supplementation.

DR. SOMYA DWIVEDI
BBS,M.D. RADIODIAGNOSIS
Fellow in Fetal Imaging
I.O.T.A Certified for Women Imaging
FMF-UK Certified for NT scan ,Pre-Eclampsia screening,Fetal abnormalities & Fetal Echo
Advanced course I.S.U.O.G. for obstetric imaging
Reg. No.: MP-14794

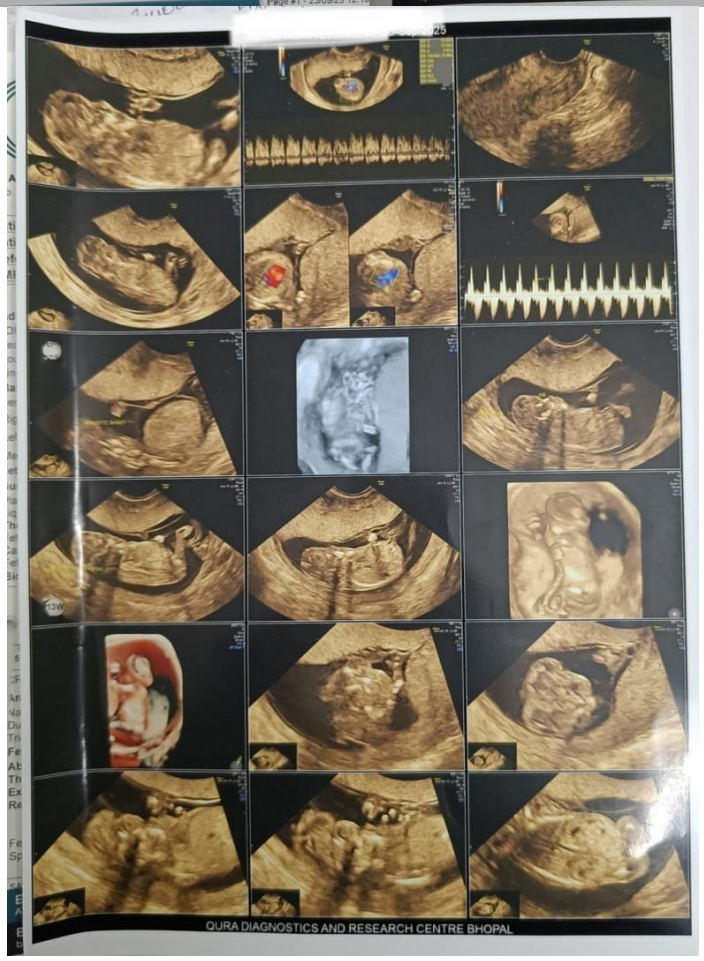
Disclaimer
I DR SOMYA DWIVEDI,DECLARE THAT WHILE CONDUCTING USG ON MRS. AARTI NEMA, I HAVE NEITHER DETECTED NOR DISCLOSED THE SEX OF HER FETUS TO ANYONE IN ANY MANNER.This is not anomaly /Fetal Echo and is only a professional opinion and not final diagnosis.It should be clinically interpreted by clinician.The report is not valid for medicolegal purposes.In case of lying error inform signing authority.
SAVE GIRL CHILD.

SAVE GIRL CHILD

EMERGING DIAGNOSTIC CENTRE OF MADHYA PRADESH
AT FMPCCI - 5th OUTSTANDING ACHIEVEMENT AWARD 2017-18

BEST DIAGNOSTIC & IMAGING CENTRE IN MADHYA PRADESH
by WORLDWIDE ACHIEVERS INTERNATIONAL HEALTHCARE SUMMIT & AWARDS, 2017

Page #2 - 23/09/25 12:10 PM



- Abnormal intracranial anatomy seen
- No cranial vault noted
- Extreme hyperextension of the neck with star- gazing appearance
- Upper cervical spine is not visualised
- Retroflexion of the head seen
- Gestational age 12 weeks 02 days
- Iniencephaly with amniotic band sequence

Neural tube defects (NTDs) can be diagnosed during pregnancy through a combination of blood tests and imaging

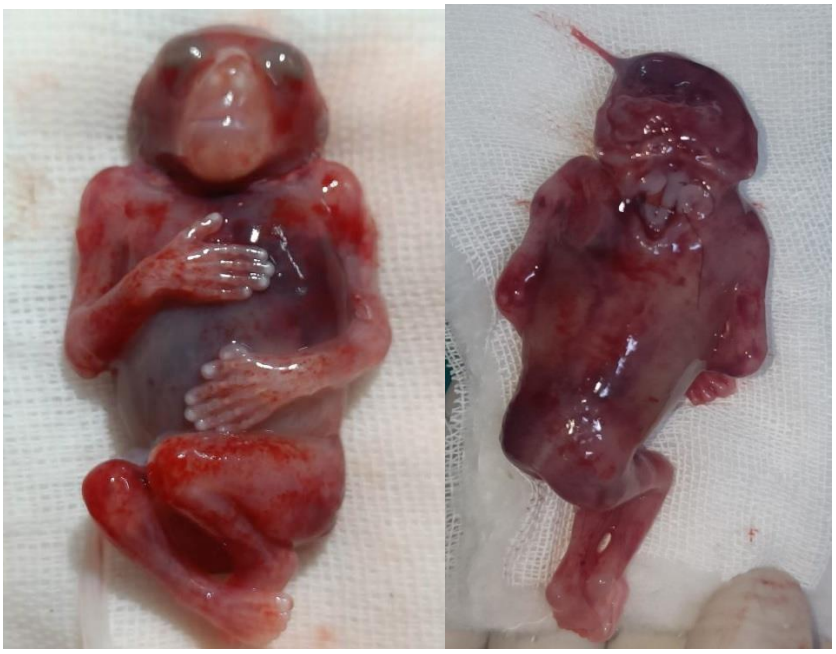
- **MSAFP-**One common method is the maternal serum alpha-fetoprotein (MSAFP) test, usually done between 15 and 20 weeks of pregnancy. High levels of AFP in the mother's blood may suggest an NTD. Ultrasound is the most reliable tool for confirming the diagnosis, as it can visually detect abnormalities in the baby's brain or spine.

- **Amniocentesis-** In some cases, amniocentesis may be done to measure AFP and acetylcholinesterase levels in the amniotic fluid. Early diagnosis helps in planning further care and management.

CONCLUSION

This single case study represents a female of 28 years old with chief complain of Amenorrhea since 4 months presented for a routine antenatal check-up, during which ultrasonography (19/09/25) revealed single live fetus with mean gestational age of 12 weeks 03 days, Acrania with exencephaly. She was therefore advised to undergo a repeat ultrasonographic evaluation at a higher centre for confirmation (23/09/25) suggests single live fetus with mean gestational age 12 weeks 02 days, F/S/O Iniencephaly with amniotic band sequence. Abnormal cranial anatomy, no cranial vault, extreme hyperextension of the neck with star-gazing appearance & retroflexion of head seen. This confirms the abnormality and referred to higher centre for further management.

At a higher centre, after obtaining informed consent, the patient was administered Misoprostol, and the termination of pregnancy was successfully managed. Examination of the abortus revealed polydactyly along with acrania and exencephaly. These congenital anomalies show a close correlation with *Anasthi Garbha*, as described in classical *Ayurvedic Samhita*, where defective bone formation is associated with severe developmental abnormalities.



The actual solution to the question as to how sexual relationship between two phenotypic females results in formation of *Anasthi Garbha*. It is a well-know fact that androgens (testosterone and Dihydrotestosterone) help in building muscles, bones and other connective tissues and embryogenesis involves synthesis of genes in a cascading manner. If a male pseudohermaphrodite with Steroid 5-α-reductase type 2 enzyme deficiency (with spermatogenesis) is carrying another autosomal recessive mutant gene, responsible for the skeletal dysplasia or connective tissue disorder, intercourse with a normal female and if the female conceives there is a possibility of formation of *Anasthi Garbha.* Another possibility is that a new mutant dominant gene in the developing embryo results in formation of *Anasthi Garbha* .Two gene core-binding factor A-1 (CBFA-1) and Indian hedgehog are important for osteoblast development. The important fact to remember that *Anasthi Garbha* need not necessarily result from sexual relationship between a normal female and *Shandha;* it can also be born born to

an apparently normal looking couple or couple having family history of skeletal dysplasia.

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