

Giant Oocyte with Two Polar Bodies: Case Report of Self Patient

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Abstract- Here we report a case of the giant oocyte with two polar bodies, with the immense of ART technology, formally giant oocytes are a very rare phenomenon among humans and embryos may develop from oocytes. (1,2), and Giant oocytes are defined to have a 35% larger diameter and twice the volume of the normal oocyte. Fertilization and progression of a giant oocyte are suspected to be the cause of triploidy, which is defined as triploidy with two maternal and one paternal complement. The hypothesis for the mechanism of their formation is a cytoplasmic fusion of two oogonia and the second one is the lack of cytokinesis during mitotic divisions in an oogonium. In this case report, we present one Giant oocyte with two distinct polar bodies. Giant oocytes can develop into embryos that are morphologically normal, but genetically abnormal, embryologist should aware of this phenomenon. For this reason, the scientific aim of this report is to present make awareness among practicing embryologists.

Keywords— Giant oocyte, meiotic spindle, polar bodies

I. INTRODUCTION

1. In the New Era of Assisted reproductive technology, the terms normal and abnormal oocytes have been defined and one type of abnormal oocyte is the giant oocyte. Giant oocytes are defined to have a 35% of larger diameter and twice the volume of the normal oocyte. the first theory for the giant oocyte formation is a cytoplasmic fusion of two oogonia and the second one is the lack of cytokinesis during mitotic divisions in an oogonium. Fertilization and progression of a giant oocyte are suspected to be the cause of digenic triploidy, which is triploidy with two maternal and one paternal complement. In this case report, we report giant oocyte with two distinct polar bodies.

II. METHODOLOGY

2. CASE REPORT

29- year old woman with a history of primary infertility of 1 year visited our centre. She had a multiple IUI failed cycle, and the patient was submitted to controlled ovarian hyperstimulation, using a flexible GnRH antagonist protocol from May 2, 2022. As a reported previous study. The injection of rFSH (Follitropin beta (FSH) Injection Recagon 225 IU/0.36 ml daily and was individualized according to the patient, age, body mass of index(BMI),

antral follicle count, baseline E2, P, FSH, LH, concentration. The GnRH antagonist used was cetrorelix acetate (Cetrotide: Merck-Serono Ltd.,) treatment with rFSH and cetrorelix acetate was continued until the day of the final oocyte maturation trigger. The final oocyte maturation Dual trigger was given decapeptide 0.2 mg/s/c and fertigny 200 IU/ ML. 35-36 h after r-HCG injection, oocyte aspiration was performed, which was guided by transvaginal ultrasound. 5 oocyte cumulus complex was retrieved (OCC). All cumulus complex surrounded oocyte was kept in hera cell 1500 Co2 incubator at an atmosphere of 6% Co2, at 37°C for 2-3 hours after oocyte aspiration. After 2-3 hours of incubation submitted to the mechanic step of denudation. On the stereo zoom microscope, for denudation vitromed HYDASE for removing cumulus cells, vitromed, Germany used with a concentration of 0.5ml. (Flexipet adjustable handle set of a 150 µm and 170µm internal diameter tip (stripper tip handle Indiana USA). Oocytes underwent mechanical aspirate and expel to remove cumulus cell, once cumulus removed can able see the nuclear maturation. By the end of the denudation, oocytes were placed 60mm falcon ICSI Dish, 25 µl drop of (SAGE HEPES with HTF), covered with (VITROMED OIL For IVF culture, light paraffin oil, vitromed, Germany). The denuded oocyte was examined under a 40X OLYMPUS IX73 Narshige Research inverted Microscope. During examining denuded oocytes we encountered Giant

oocyte with two distinct polar bodies. Oocyte size was measured under RI Viewer software. husband semen analysis report was found to be normozoospermic, according to world health organization guidelines. 5 oocyte was collected during pick up, 1 Giant oocyte with two distinct polar body rest all oocyte is Germinal vesicle oocyte(GV). ICSI was Done for Giant oocyte for examination but no progression was observed.

III. DISCUSSION

Our case report and the studies by the other researchers prove that giant oocytes at a different stage of maturation can be retrieved in human IVF cycles. The giant oocyte with two polar bodies in our case also evaluated as an MII demonstrates that even being stage oocyte under phase contrast optics, lack of instrument availability we can't determine the maturity of the spindle under a polarized microscope.

Giant oocytes can become fertilized and as reported by Rosenbusch et al., they result in triploid zygotes after monospermic fertilization even if they have 2PN on day 1. the giant oocyte with two polar bodies in our case report was not fertilized and no further development was observed.

The diameters of the giant oocytes in our case were 148.78µm when measured without zona pellucid.

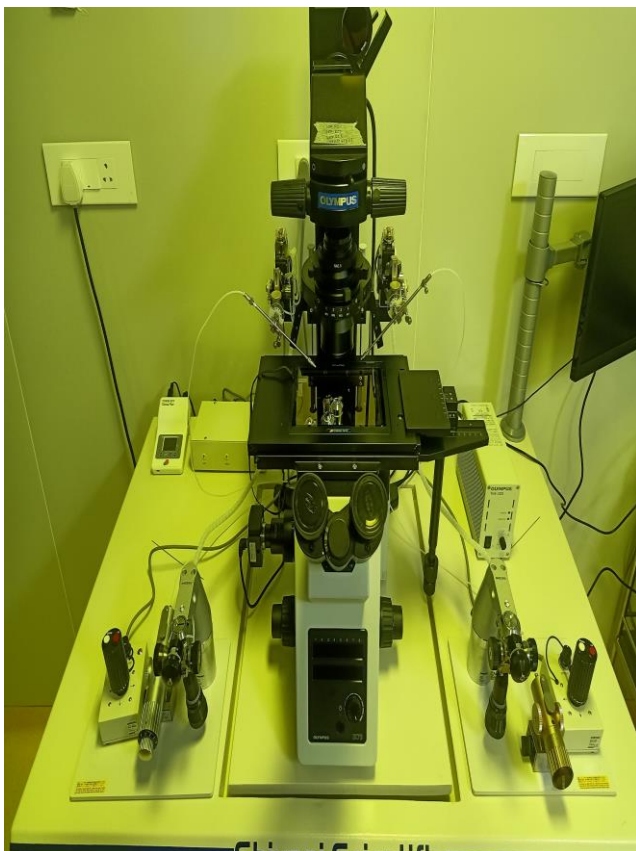


Figure1.2: Olympus IX73 Inverted Microscope

Table:1 complete blood profile(hematology /bio-chemistry/ serology/histopathology)

Clinical Notes		
Complete blood picture		
HEMOGLOBIN	8.4 GM%	11.5-145 GMS% (F) 13.0-16.0 GMS% (M)
Total ERYTHROCYTE COUNT(RBC)	2.8	3.5-5.5 mill/cmm
Total LEUCOCYTE COUNT(WBC)	5500H/CUMM	4000-11,000
DIFFERENTIAL COUNT		
NEUTROPHILS	60%	40-70%
LYMPHOCYTES	35%	20-40
MONOCYTES	02%	2-10
EOSHINOPHILS	03%	1-6
BASOPHILS	0%	0-0.1%
PLATELET COUNT	3,00,000 LAKHS/CUMM	1.4-4.5 L/CUMM
BLOOD PICTURE		
R.B.C'S	MICROCYTIC HYPOCHROMIC	
W.B.C'S	Within normal limits	
Hepatitis b surface antigen	NON - REACTIVE	
Hepatitis "c" virus	NON REACTIVE	-
VDRL	NON REACTIVE	-
TRIDOT	NON - REACTIVE	
CLOTTING TIME	1:50	1-3MINUTES
BLEEDING TIME	3:20	3-7 MINUTES
ANITI MULLERIAN HORMONE	14:30	4.0-6.0 ng/ml

Table:2 complete blood profile(hematology /bio-chemistry/ serology/histopathology)

Random blood sugar	115mg/dl	70-170mg/dl
Serum electrolyses	140mmol/l	135-145
Sodium	4.0mmol/l	3.5-5.5
Chloride	103mmol/l	96-106
Serum creatinine	0.7mg/dl	0.6-1.5
Liver function test		
Total bilirubin	0.6mg/dl	0.2-1.1
Direct	0.2mg/dl	0-0.3
Indirect	0.4mg/dl	0-0.8
AST (SGOT)	27lu/l	Up to 41
ALT(SGPT)	23IU/L	0.3-1.2
ALP (ALKANINE PHOPHATSE)	192IU/L	1 MONTH TO 9 YEARS 82-383 10yrs to yrs 42-390 Adults 53-141
Serum protein	7.6mg/dl	60-8.3
Serum albumin	4.0mg/dl	3.5-5.2
Alb/glo ratio	1.2	1.0-2.3
PHOTHROMBIN (PT)	17 SEC	10-14

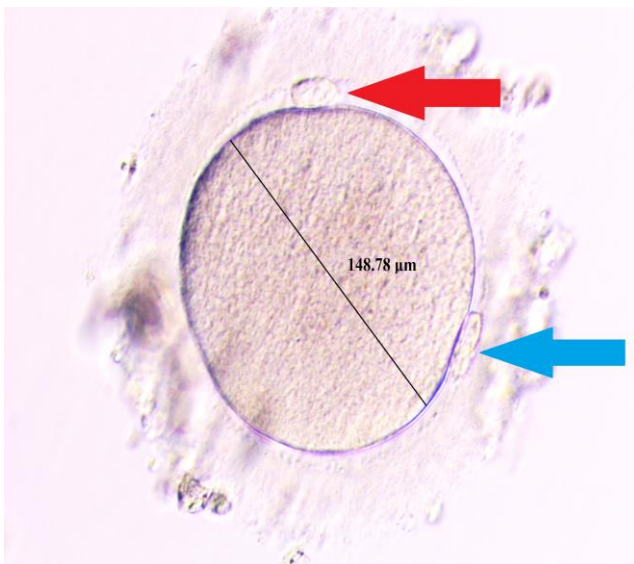


Figure 1.2: Giant oocyte with two distinct polar bodies with Thick zona pellucida, 12 o clock and 4 o clock position. Under 20X in OLYMPUS IX73 Narshige Research inverted Microscope.

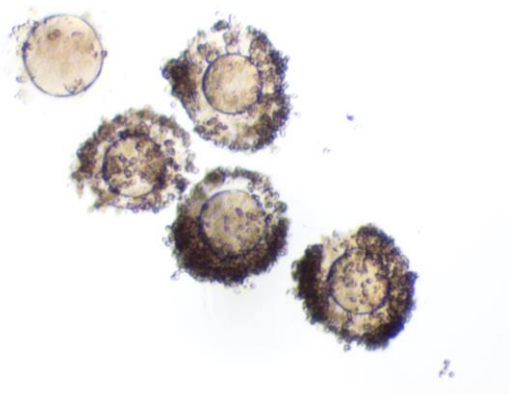


Figure 1.3: partially denuded oocyte after Hylase solution

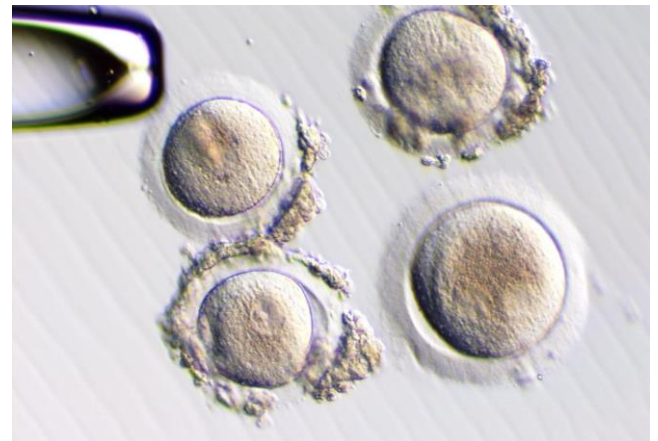


Figure 1.4: Germinal Vessicle oocyte (GV) with cytoplasmic abnormalities.

IV. CONCLUSION

Gaint oocytes are rarely observed in humans, in some case it get fertilized and developed. in our case study it is not fertilized and no further development observed. the finding in this case study reveal that embryo derived from giant oocyte might be triploide. based on the finding in this case report. we should not use embryo derived from giant oocytes with two distinct polar body not advisable for embryo transfer.

V. FUTURE SCOPE

We can use polarized microscope to visualize meiotic spindle in Gaint oocyte, so we can identify how many spindle present in giant oocyte.

VI. AUTHORS ROLE

All authors contributed to data interpretation and critical revision and finally approved the version to be published.

VII. FUNDING

No funding was received for this case report.

VIII.CONFLICT OF INTREST

The author have no conflict of intrest to declare related to this case study.

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AUTHORS PROFILE

Dr. Jayesh Amin – Clinical Director – WINGS IVF Group. Gujarat's chapter secretary for Indian Fertility Society (IFS). Educational Profile He has passed MBBS and MD from M.P. Shah Medical College, Saurashtra University. He has accomplished his fellowship for IVF and Embryology by LARS Johnson, Sweden and he is a member of Gujarat ISSAR Chapter, ESHERE, IAGE. Focus His prime area of interest include trouble shooting complex infertility, recurrent IVF failure cases, application of latest technologies in the field of IVF & role of genetics in IVF treatments.



Achievements

Dr. Jayesh Amin is a national and international faculty at various fertility conferences in India and abroad. Dr. Jayesh Amin has been awarded as a Times of India- IVF icon for 2018 & 2019, Excellence in Infertility treatments by the then Union Health Minister Shri.J.P.Nadda & Fertility Game Changer (West)-2019 by Economic Times.

Dr. Paresh Makwana He did his Bachelor of Veterinary Science and Animal Husbandary and also Master of Veterinary Science from Anand Agricultural University. Pursued MBA in Healthcare Science from Sikkim Manipal University. One of finest embryologist in india. Biopsy expert, life time member of all Indian fertility society like, ACE,IFS,ISAR.



Focus

Andrology: Semen Analysis with all the parameters, Sperm preparation for IUI, Sperm freezing, PESA/TESA/Micro TESA sample preparation & ICSI. Embryology: IVM, IVF, ICSI, Oocytes staining, Laser Assisted Embryo Hatching, Blastocyst culture, Embryo vitrification and thawing, Grading of oocytes and Embryos, Embryo Transfer. Management: Selection of equipments, Maintaining Patient data Records, Quality Control of the lab, Designing of ART lab, Assisting in

CME, Conference, Camp Organization, Website content preparation, Consent forms, brochure preparation, Economical stock maintenance for Media and disposables.

Dr. Nyma Sultana – Managing Director – Wings Zoya IVF, Khammam, Telangana, She passed MBBS from SVS medical College, mahabubnagar, Telangana, 2004, and she did her PG in MS, OBG from kakatiya medical college, warangal, Telangana 2010, she had more than 18+ experience in OBG and Infertility in khammam, Telangana. Attended various National and international conference related OBG & IVF. Delivery Guest Lecture in Various Medical college and Institution.



Jayaram C, is working as a Embryologist in wings zoya IVF, Khammam, Telangana. He has done his Masters in clinical embryology and pre-implantation Genetics from university of mysore, karnataka, india. He did his research project "outcome of cleavage stage versus blastocyst stage cryopreserved embryo transfer in ICSI cycle in aarush IVF, Mumbai. he got trained under national and international experts in the field of IVF. Published several review article, research article, in national and international journal in ART. interested in Human genetics and cryobiology, male infertility attend several national and international conference. Lifetime member of ACE, IFS, ISAR, India. ongoing research project Annamalai university, Tamilnadu, artificial intelligence in Deep learning and embryo selection.



Dr. Mohammad Sehba Kousar – Mohammad kousar working as a duty doctor wings zoya IVF, Khammam, Telangana. She has done her Doctor of Pharmacy from Browns college of Pharmacy, Khammam. She did her Internship in zoya Narsingh Home. She did research work on "Effect of smoking on count/motility/morphology on patient attending IVF centre".



Ms. Bharvi Patel, Bharvi Patel is working as an Embryologist in Dev ART IVF & Shachi Women's hospital, She has done her M.Sc. in Life Sciences (Zoology) from Gujarat university and did her Diploma in Clinical Embryology from Amity University, Uttar Pradesh. She did research work on Impact of oocyte with morphological abnormalities on blastocyst formation rate. She also attended several workshops, Conferences and lectures held by various national and international institutions.

