

# Discovery of cephalopagus conjoined twins at an early term of 8+6 weeks: Case report

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## Supplementary material: videos

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## ABSTRACT

Conjoined twins are a rare complication of monozygotic pregnancies resulting from incomplete separation of the embryonic disc after day 13. Early antenatal detection is essential for appropriate prenatal management and timely obstetric intervention. This case report describes the early detection of a conjoined twin pregnancy during a dating ultrasound. It presents the clinical findings and documented images of a rare presentation, particularly given the very early gestational age at diagnosis. The patient presented for a first dating ultrasound in her first pregnancy. The examination revealed an enlarged fetus with multiple anomalies highly suggestive of conjoined twinning. Once the diagnosis was established, a detailed discussion regarding the pregnancy prognosis was held with the couple. They subsequently opted for medical termination of the pregnancy. Anatomopathological examination confirmed the diagnosis of conjoined cephalopagus twins. Karyotypic analysis revealed no chromosomal abnormalities. The application of a rigorous and systematic diagnostic approach, combined with careful attention to detail, enabled the early detection of this sporadic condition. Early diagnosis allows for timely clinical management and may reduce the risk of both obstetric and psychological complications.

## KEYWORDS

Conjoined twins, cephalopagus, early diagnosis, ultrasound, congenital malformation, case report.

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## Introduction

Conjoined twins result from incomplete division of the embryonic disc occurring after the 13th day of gestation<sup>[1]</sup>. The first prenatal diagnosis of conjoined twins by ultrasound was reported in 1976 by Wilson at 35 weeks of gestation<sup>[2,3]</sup>. Since then, diagnostic capabilities have improved substantially, allowing detection as early as seven weeks of gestation<sup>[4,5]</sup>.

The prevalence of conjoined twins ranges from 1 in 50,000 to 200,000 live births<sup>[4]</sup>, making this condition one of the rarest congenital anomalies. There is a marked female predominance, accounting for approximately 70% of cases [4]. The prognosis remains poor: 40%–60% of conjoined twins are stillborn, and approximately 35% of live-born infants do not survive beyond the first day of life<sup>[6,7]</sup>.

Prognosis depends on the site of fusion, the type of conjoined twins, the extent of shared organs, and the presence of associated malformations. Several classification systems have been proposed, with Spencer's classification being the most widely adopted. According to this system, conjoined twins are categorized as either ventrally joined—accounting for approximately 87% of cases, with fusion occurring along the anterior midline—or dorsally joined, comprising the remaining 13%, with fusion arising from the neural tube<sup>[8]</sup>.

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The most frequently encountered types of conjoined twins include thoracopagus (28% of cases), thoraco-omphalopagus (18.5%), omphalopagus (10%), heteropagus (10%), and craniopagus (6%). Less common forms include pygopagus, rachipagus, ischiopagus, and cephalopagus<sup>[7-9]</sup>. There are no known cases of conjoined triplets or quadruplets<sup>[2,3]</sup>. However, some reports describe triplet pregnancies in which two of the fetuses are conjoined<sup>[10]</sup>.

It has been repeatedly reported in the literature that early diagnosis is essential to rapidly establish prognosis and to offer appropriate management, including continuation of the pregnancy or medical termination of pregnancy<sup>[11]</sup>. However, this diagnosis is not always straightforward<sup>[12]</sup>. Surgical management remains

a major challenge. The first successful separation of conjoined twins was performed in the 17<sup>th</sup> century by Johannes Fatio in Switzerland in twins joined at the umbilicus [13].

Currently, only a limited number of pediatric surgical teams have the expertise to perform separation procedures in conjoined twins, and only in the absence of severe associated malformations. When prenatal ultrasound reveals major anomalies, medical termination of pregnancy (MTP) should be considered.

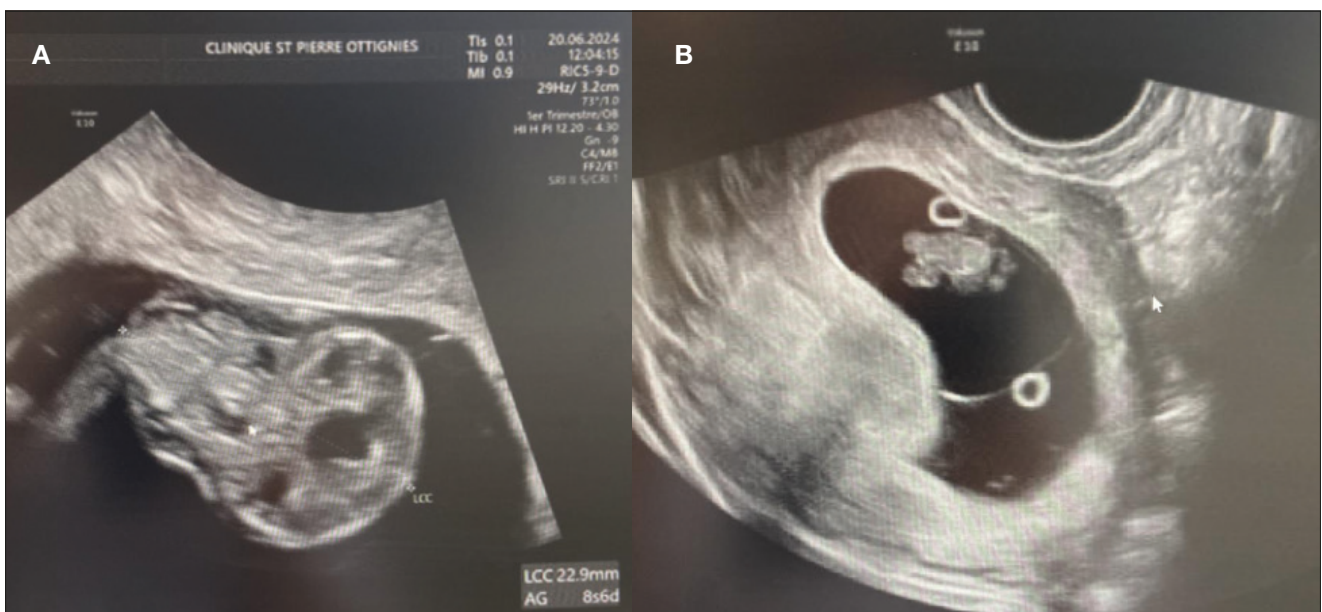
### Case presentation

A 33-year-old patient, gravida 1 para 0, presented for a routine examination and dating ultrasound on 06/20/2024. The estimated gestational age was 8 weeks + 6 days. She had no relevant

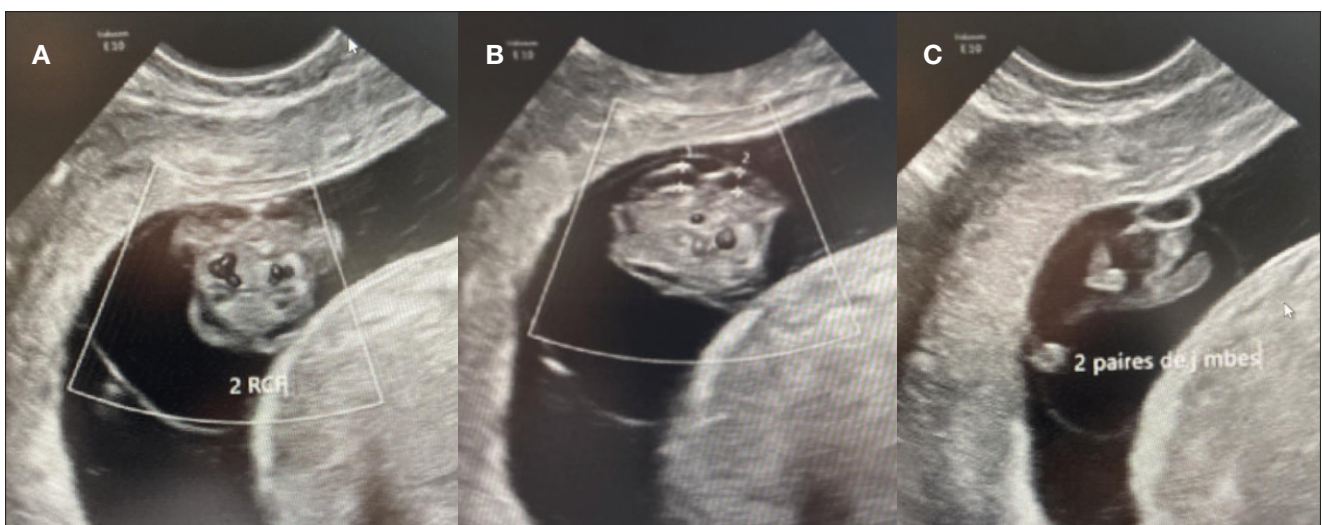
medical history. Her family history was notable for a cousin with trisomy 21. The diagnostic assessment was performed using transabdominal and transvaginal ultrasonography, complemented by three-dimensional (3D) ultrasound. The initial evaluation occurred during a routine first-trimester scan for pregnancy dating at 8+6 weeks of gestation. Ultrasound examination revealed a 23 mm embryo with an enlarged head (Figure 1A). A single gestational sac with two yolk sacs was identified, consistent with a monochorionic–monoamniotic twin pregnancy (Figure 1B).

The ultrasound images demonstrated a single spinal column, two stomachs, and two hearts (Figure 2A). Two fused abdomens were observed, along with subcutaneous edema measuring 2.0 mm and 2.1 mm (Figure 2B). In addition, two pairs of

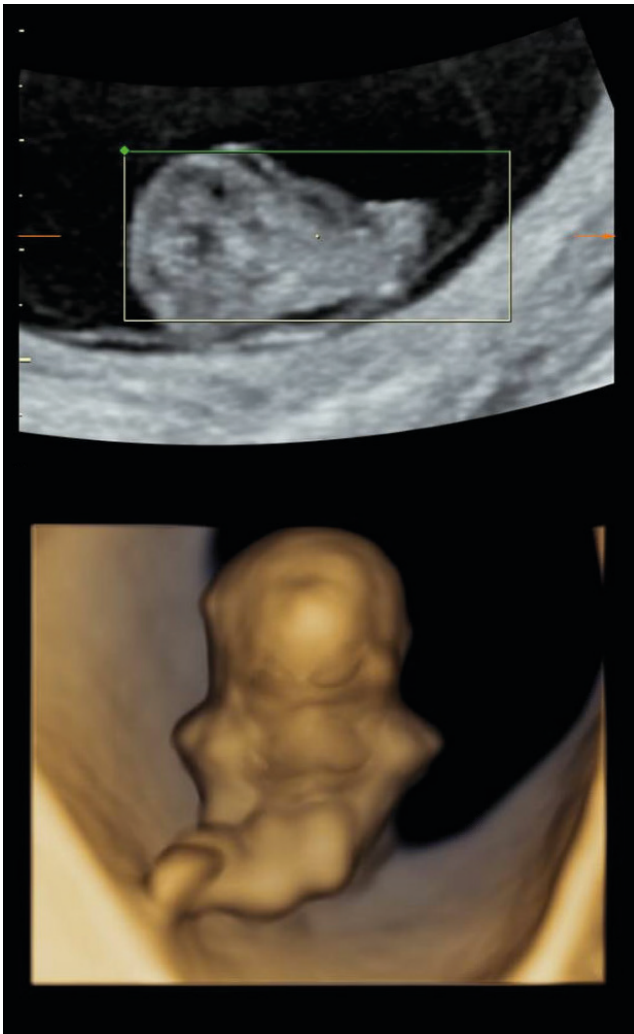
**Figure 1.** 8+6 weeks of gestation. A: Enlarged fetus. B: Monochorionic monoamniotic pregnancy with two distinct yolk sacs observed within a single gestational sac. A single fetal structure is visible and one can already notice some of the limbs.



**Figure 2.** 8+6 weeks of gestation. A: Cross-sectional view with presence of two hearts, two probable stomachs and a single spinal column suggestive of conjoined twins. B: Cross-sectional view revealing subcutaneous edema in the abdominal area, with measured thickness of 2 mm and 2.1 mm respectively. C: Two distinct pairs of lower limbs can be identified.



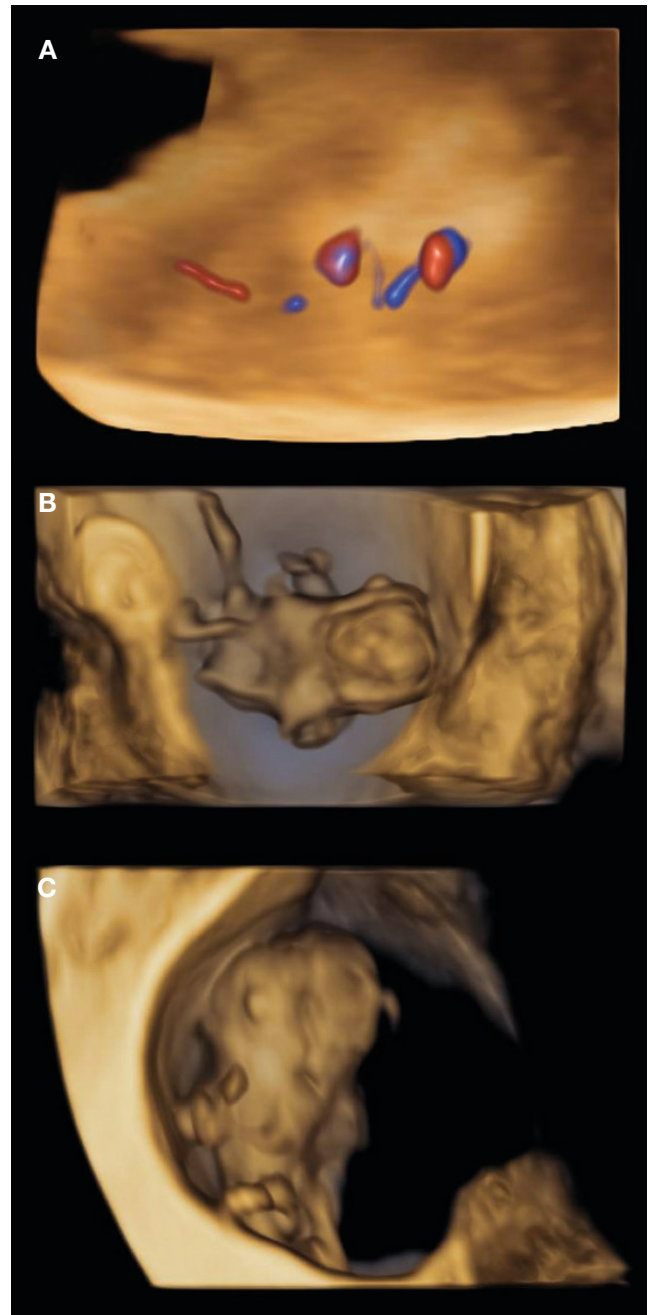
**Figure 3.** 9 weeks of gestation. This 3D image lacks the necessary clarity for a conclusive diagnosis.



moving legs were identified (Figure 2C). The trophoblast was located anteriorly, and a single corpus luteum was observed in the left ovary. Two follow-up examinations were required at 9 and 10 weeks of gestation to establish the diagnosis. At 9 weeks of gestation, the 3D ultrasound images lacked sufficient clarity for a definitive diagnosis (Figure 3). At 10 weeks of gestation, color Doppler imaging demonstrated two distinct cardiac activities, indicating the presence of two separate circulatory systems (Figure 4A). Three-dimensional imaging further revealed the face of one of the conjoined twins and confirmed the presence of two umbilical cords (Figure 4B).

Once the diagnosis was confirmed, a discussion regarding the pregnancy prognosis was held with the couple. Given the poor prognosis, they opted for medical termination of pregnancy (MTP). At 10+3 weeks of gestation, the patient was admitted for MTP. A mifepristone/misoprostol protocol was administered under epidural anesthesia. Complete trophoblastic retention required non-aspirative curettage. No hemorrhage was observed. Samples were sent for pathological examination (trophoblast and fetuses), and a skin biopsy was obtained for genetic karyotype analysis.

**Figure 4.** 10 weeks of gestation. A: Color Doppler image revealing two distinct cardiac activities. B: 3D image showing the face of one of the conjoined twins and two umbilical cords. C: 3D image providing clear evidence of the conjoined nature of the twins without any distinction between fetal structures.



Karyotype analysis and fetal autopsy performed by anatomical pathology yielded the following findings: “*External examination (Figure 5): male conjoined twins classified as cephalopagus, with a combined weight of 9 g. The twins were fused dorsally, extending from the cranial vault to the pelvis. A single skull was present, with two distinct faces. One face exhibited a proboscis and a single ocular globe containing two irises. A total of four limbs were identified. Both fetuses presented with anal atresia. No internal examination was performed in accordance with the parents’ wishes.*”

**Figure 5.** 10+4 weeks of gestation. A: Photograph after the expulsion displaying the conjoined twins with a shared head, one face presented in frontal view, as well as two pairs of arms (one arm, partially detached from the shoulder during expulsion, is now connected to a skin flap positioned more caudally), and two pairs of legs. B: Photograph showing the dorsal aspects of the conjoined fetuses, with their head and back shared. A division is obvious in the lower spine resulting in two pairs of legs. Additionally, one of the two genital tubercles is noticeable. C: Photograph depicting the face of the second conjoined twin, viewed from the front. It presents a single eye with two irises, along with a proboscis. A skin flap extending caudally and supporting one of the four arms is also visible.



## Discussion

Conjoined twinning is an exceptionally rare complication of monozygotic pregnancies, resulting from incomplete separation of the embryonic disc beyond the 13<sup>th</sup> day of gestation. Classification is based on the site and extent of fusion, which directly influences prognosis. Early antenatal identification is crucial for planning appropriate prenatal care and for considering timely obstetric interventions.

A recent review of the literature identified several relevant studies, including one reporting 20 cases of conjoined twin pregnancies diagnosed between 2016 and 2022, with gestational ages at

diagnosis ranging from 10 to 35 weeks and an incidence of cephalopagus twins of 20% [14]. An earlier retrospective study published in 2011 described 36 cases over a 12-year period and reported a cephalopagus detection rate of only 2.8% [15].

In addition, we compiled the complete results of our review (Table 1), summarizing the most recent findings on conjoined twin pregnancies (2000–2024), including gestational age at diagnosis, type of conjoined twins, and reported frequencies of cephalopagus conjoined twins in cohort studies. Notably, our review identified only a single case of conjoined twin diagnosis before 8 weeks of gestation, detected during post-in vitro fertilization follow-up [9].

**Table 1.** Summary of reported conjoined twin pregnancies in the literature from 2000 to 2024.

Year	Country	Number of cases studied	Gestational age at diagnosis (weeks)	Type of conjoined twins	Reference
2000	Japan	1	13	Cephalopagus	Ultrasound Obstet Gynecol [16]
2003	Israel	1	13	Cephalopagus	Israel Medical Association Journal [17]
2010	Pakistan	1	29	Cephalopagus	Biomedical Imaging and Intervention Journal [12]
2011	Worldwide	383	Unknown	Different types (5.5% Cephalopagus)	American Journal Medical Genetics Part C [18]
2011	Brazil	36	24.2 ± 4.8	Different types (2.8% Cephalopagus)	Prenatal Diagnosis [15]
2016	Japan	1	12	Dicephalus parapagus	Case Report in Obstetrics and Gynecology [19]
2016–2022	China	20	10 - 35	Different types (20% Cephalopagus)	Journal of Clinical Ultrasound [14]
2018	Turkey	1	14	Cephalopagus	Journal of Clinical Ultrasound [22]
2020	China	1	8	Thoracopagus	World Journal of Clinical cases [20]
2020	Bosnia and Herzegovina	1	21	Cephalopagus	Radiography / the College of Radiographers [9]
2023	Slovak Republic	1	13	Thoracopagus	Ceska Gynekologie [21]
2024	USA	1	7	Cephalopagus	BMJ Case Reports [23]

These findings highlight the significance of our case, as the diagnosis of a cephalopagus conjoined twin pregnancy at 8+6 weeks represents an exceptionally early and clinically relevant observation. This further underscores the critical role of ultrasound in the early identification of severe congenital malformations. The extent of anatomical fusion observed in this case—characterized by a single head with two faces, two distinct hearts, and a shared vertebral column—rendered surgical separation nonviable and was therefore associated with an extremely poor prognosis. The parents, initially unprepared for such a diagnosis, required time for reflection and additional clarification. A follow-up ultrasound performed one week later allowed further diagnostic refinement. This underscores the importance of maintaining a high index of suspicion and being prepared to re-evaluate imaging findings that appear questionable. Ultimately, after comprehensive counseling regarding prognosis and therapeutic options, the couple elected to proceed with medical termination of the pregnancy.

## Conclusion

This case report underscores the critical importance of early diagnosis in sporadic obstetric pathologies. Detection of this rare case of cephalopagus conjoined twins at an early gestational age of 8 weeks and 6 days was made possible through a careful and thorough ultrasound examination. Such early identification likely played a key role in mitigating potential obstetric and psychological complications that may arise from delayed diagnosis.

## References

- Blé RK, Séni K, Adjoussou S, Quenum G, Akaffou E, Koné M. Jumeaux conjoints craniopages: difficultés de prise en charge en milieu africain [Craniopagus conjoined twins: difficulties of management in Africa]. *Gynecol Obstet Fertil*. 2008;36(1):56-59.
- Wilson RL, Cetrulo CL, Shaub MS. The prepartum diagnosis of conjoined twins by the use of diagnostic ultrasound. *Am J Obstet Gynecol*. 1976;126(6):737.
- Benchiba I, Saoud MK, Mamouni N, Errarhay S, Bouchikhi C, Abdelaziz B. Diagnostic à terme de jumeaux conjoints [Diagnosis of conjoined twins in a pregnant woman at term]. *Pan Afr Med J*. 2020;35:8.
- Mikolo AML, Minko JI, Kamgaing EK, et al. Jumeaux conjoints thoracopages: à propos d'un cas à Libreville et revue de la littérature [Thoracopagus conjoined twins: case study conducted in Libreville and literature review]. *Pan Afr Med J*. 2022;41:220.
- Guèye MD, Diouf AA, Niang MM, Diallo M, Cissé ML, Moreau JC. Accouchement de jumeaux conjoints de découverte fortuite au cours du travail au CHU de Dakar [Delivery of conjoined twins fortuitously discovered during labor at the University Hospital of Dakar]. *Pan Afr Med J*. 2012;12:102.
- Chelliah KK, Faizah MZ, Dayang AA, Bilkis AA, Shareena I, Mazli M. Multimodality imaging in the assessment of thoraco-omphalopagus conjoined twin: Lessons to learn. *Case Rep Radiol*. 2012;2012:564036.
- Kaufman MH. The embryology of conjoined twins. *Childs Nerv Syst*. 2004;20(8-9):508-525.
- Spencer R. Anatomic description of conjoined twins: A plea for standardized terminology. *J Pediatr Surg*. 1996;31(7):941-944.
- Vegar-Zubović S, Prevljak S, Behmen A, Bektešević H, Zubović D, Jusufbegović M. Conjoined twins – A case report of prenatal diagnosis of cephalothoracoomphalopagus. *Radiography (Lond)*. 2020;26(2):e126-e128.
- Al Rabeeah A. Jumeaux siamois: Passé, présent et futur. e-Mem Acad Natl Chir. 2006;5(3):45-49.
- Kuroda K, Kamei Y, Kozuma S, et al. Prenatal evaluation of cephalopagus conjoined twins by means of three-dimensional ultrasound at 13 weeks of pregnancy. *Ultrasound Obstet Gynecol*. 2000;16(3):264-266.
- Sabih D, Ahmad E, Sabih A, Sabih Q. Ultrasound diagnosis of cephalopagus conjoined twin pregnancy at 29 weeks. *Biomed Imaging Interv J*. 2010;6(4):e38.
- Rickham PP. The dawn of paediatric surgery: Johannes Fatio (1649–1691)—His life, his work and his horrible end. In: *Historical Aspects of Pediatric Surgery*. Vol. 20. Berlin: Springer; 1986. p. 94–105.
- Xiao J, Liao K, Tan Z, et al. The application value of prenatal ultrasound in conjoined twins. *J Clin Ultrasound*. 2025;53(1):122-128.
- Brizot ML, Liao AW, Lopes LM, et al. Conjoined twins pregnancies: experience with 36 cases from a single center. *Prenat Diagn*. 2011;31(12):1120-1125.
- Kuroda K, Kamei Y, Kozuma S, et al. Prenatal evaluation of cephalopagus conjoined twins by means of three-dimensional ultrasound at 13 weeks of pregnancy. *Ultrasound Obstet Gynecol*. 2000;16(3):264-266.
- Makhoul IR, Goldsher D, Okopnik M, Bronshtein M. Early prenatal diagnosis of conjoined cephalopagus twins. *Isr Med Assoc J*. 2003;5(7):530-531.
- Mutchinick OM, Luna-Muñoz L, Amar E, et al. Conjoined twins: a worldwide collaborative epidemiological study of the International Clearinghouse for Birth Defects Surveillance and Research. *Am J Med Genet C Semin Med Genet*. 2011;157C(4):274-287.
- Watanabe K, Ono M, Shirahashi M, Ikeda T, Yakubo K. Dicephalus parapagus conjoined twins diagnosed by first-trimester ultrasound. *Case Rep Obstet Gynecol*. 2016;2016:8565193.
- Liang XW, Cai YY, Yang YZ, Chen ZY. Early ultrasound diagnosis of conjoined twins at eight weeks of pregnancy: A case report. *World J Clin Cases*. 2020;8(21):5389-5393.
- Ostatníková M, Chválna Z, Gábor M, Záhumenský J. Thoracopagus conjoined twins. *Ceska Gynekol*. 2023;88(3):186-189.
- Yalçın SE, Akkurt MÖ, Yavuz A, Yalçın Y, Sezik M. Prenatal sonographic diagnosis of cephalopagus conjoined twins at 14 weeks of pregnancy. *J Clin Ultrasound*. 2018;46(6):408-411.
- Boedeker D, Brolinson M, Mehlhaff K, Hill M, Spitzer T. Cephalopagus twins diagnosed at 7 weeks gestational age following IVF/ICSI. *BMJ Case Rep*. 2024;17(7):e260336.

**Abbreviations:** 3D: three-dimensional; MTP: medical termination of pregnancy.

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### Ethical considerations

The couple provided informed consent for the anonymous publication of the data and images related to their medical case.

### Conflict of interest

The authors declare no potential conflicts of interest with respect to the case presentation, authorship, and/or publication of this article.