Corrigendum

Corrigendum to “Prenatal Diagnosis of Cardiac Diverticulum with Pericardial Effusion in the First Trimester of Pregnancy with Resolution after Early Pericardiocentesis”

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In the article titled “Prenatal Diagnosis of Cardiac Diverticulum with Pericardial Effusion in the First Trimester of Pregnancy with Resolution after Early Pericardiocentesis” [1], there were errors in Tables 2 and 3 and in the text citations of some references in the Discussion.

The errors in the in-text citations of references in the Discussion should be corrected as follows:

The original text: Ultrasonographic findings associated with diverticula include pericardial effusion, cardiomegaly, septal defects and arrhythmia with fetal death before delivery, and hydrops [6, 13, 14].

The corrected text: Ultrasonographic findings associated with diverticula include pericardial effusion, cardiomegaly, septal defects and arrhythmia with fetal death before delivery, and hydrops [6, 13, 28, 32].

The original text: Thus, the observation of pericardial effusion makes it necessary to examine the cardiac function [1, 6, 15].

The corrected text: Thus, the observation of pericardial effusion makes it necessary to examine the cardiac function [1, 6, 16].

The original text: Five of them showed spontaneous resolution (71%) and 2 resulted in intrauterine death (29%): one of them, which occurred on week 26, was associated with trisomy 18 and the other, which occurred on week 29, was

associated with treated twin-to-twin transfusion syndrome and death of one of the twins after treatment [6, 16].

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The original text: The prognosis of this entity is generally good, although the outcome largely depends on the size and location of associated anomalies. Cases of rupture, both pre- and postnatal, arrhythmia, fetal death, heart failure, and coronary insufficiency have been described [9, 16, 18, 21, 23]. In these patients, serial control examinations are necessary to detect possible complications. In general, postnatal progression is good and surgery is not necessary in asymptomatic cases [19].

The corrected text: The prognosis of this entity is generally good, although the outcome largely depends on the size and location of associated anomalies. Cases of rupture, both pre- and postnatal, arrhythmia, fetal death, heart failure, and coronary insufficiency have been described [9, 16, 17, 28, 29]. In these patients, serial control examinations are necessary to detect possible complications. In general, postnatal progression is good and surgery is not necessary in asymptomatic cases [18].

Errors in Table 2 should be corrected as follows.

Row 25: Williams et al. (2009) [3] should be Abi-Nader et al. (2009) [2].

Rows 29, 30, and 31: Abi-Nader et al. (2009) [2] should be Williams et al. (2009) [3].

Row 32: Williams et al. (2009) [3] should be Paoletti et al. (2012) [20].

Row 33: Paoletti and Robertson (2012) [20] should be Nam et al. (2010) [21].

Row 34: Nam et al. (2010) [21] should be Olorón et al. (2011) [22].

Errors in Table 3 should be corrected as follows.

Rows 4 and 11: Cavallé-Garrido et al.: the reference in the bibliography is [6].

Row 7: McAuliffe et al. [27] should be Del Río et al. [18].

Row 8: Pradhan et al. [28] should be Davidson et al. [15].

Row 9: McAuliffe et al. [27] should be Koshiishi et al. [17].

Row 10: Perlitz et al. [30] should be Menahem [31].

Row 12: Carles et al. [24] should be Johnson et al. [16].

Row 13: Cesko et al. [25] should be Bernasconi et al. [26].

Rows 14 and 15: Brachlow et al. [23] should be McAuliffe et al. [27].

Row 19: Williams et al. [3] should be Abi-Nader et al. [2].

Row 21: Abi-Nader et al. [2] should be Williams et al. [3].

The corrected tables are shown in Tables 2 and 3.

TABLE 2: Description of the cases of cardiac diverticulum reported in the literature.

	Author	GA di	Size	Sex	Location	Karyotype	Associated anomalies	Intervention	Prenatal progression	Neonatal	Follow-up
1	Kitchiner et al. (1990) [13]	33	—	Female	Apex VI	—	Cardiomegaly	No	Stable	Vaginal delivery 40 w; cardiomegaly, tachypnea, heart murmur, muscular IVC, mild mitral regurgitation	Asymptomatic at 3.5 months of life
2	Hornberger et al. (1994) [9]	31	—	—	Lateral wall below tricuspid valve (RV)	—	—	No	—	—	—
3	Carles et al. (1995) [24]	13	—	Male	Apex LV	—	Pericardial effusion	TOP 14 w	—	—	—
4	Cesko et al. (1998) [25]	17	—	Male	Apex RV	46XY	Pericardial effusion	TOP 22 w	Stable	—	—
5	Cavallé-Garrido et al. (1997) [6]	20	Large	Female	Lateral wall below mitral valve (LV)	Trisomy 18	Ventricular septal defect, hydrops	No	Fetal death 26 w	—	—
6	Cavallé-Garrido et al. (1997) [6]	19	Small	Female	Apex RV	—	No	No	Stable; spontaneous resolution at 34 w	Asymptomatic	Asymptomatic at 22 months of life
7	Cavallé-Garrido et al. (1997) [6]	19	Small	—	Apex RV	—	Pericardial effusion	PC 20 w	Stable	Asymptomatic	Asymptomatic at 12 months of life
8	Cavallé-Garrido et al. (1997) [6]	36	Small	Male	Lateral wall below tricuspid valve (RV)	—	Pericardial effusion	—	—	—	Asymptomatic at 18 months of life
9	Johnson et al. (1996) [16]	19	3 mm	Female	Apex RV	46XX	Pericardial effusion	PC 20 w	No relapse after PC, no growth	Eutocic delivery 41 w; weight 3700 grams	Asymptomatic at 16 months of life
10	Brachlow et al. (2002) [23]	32	—	—	Apex LV	—	Cardiomegaly	No	Stable	Asymptomatic	Asymptomatic at 6 months of life
11	Bernasconi et al. (2004) [26]	22	10 × 5 mm	Male	LV lateral wall below mitral valve*	46XY	Pericardial effusion	PC 22 w	—	Fetal death 26 w, probably due to diverticulum rupture	—
12	McAuliffe et al. (2005) [27]	13	4 × 6 mm	Male	Apex RV	46XY	First trimester NT 4.2 mm Pericardial effusion	PC 16 w	Resolution of the effusion; CD stable	Eutocic delivery 38 w; weight of 3070 grams	Asymptomatic at 10 months of life

TABLE 2: Continued.

	Author	GA di	Size	Sex	Location	Karyotype	Associated anomalies	Intervention	Prenatal progression	Neonatal	Follow-up
13	McAuliffe et al. (2005) [27]	13	4 × 3 mm	Male	Apex RV	46XY	First trimester NT 2 mm Pericardial effusion	PC 14 w	Resolution of the effusion; CD stable	Eutocic delivery 38 w; weight 3150 grams Asymptomatic	Asymptomatic at 8 months of life
14	Profumo et al. (2005) [1]	14	5 × 5	Male	Apex RV	46XY	First trimester NT 3.7 mm Pericardial effusion, ascites, skin edema	PC 16 w	Resolution of the effusion and hydrops; CD stable; mild cardiomegaly	Vaginal full-term eutocic delivery; asymptomatic	Asymptomatic at 22 months of life
15	Profumo et al. (2005) [1]	12	1 mm	—	Apex RV	—	First trimester NT 1.2 mm Pericardial effusion	No	Spontaneous resolution of PE with 21 w; CD stable	Full-term eutocic delivery, asymptomatic	Asymptomatic at 17 months of life
16	Gardiner et al. (2009) [19]	14	2-3 mm	—	Apex RV	Normal	Pericardial effusion	PC 14 w	Resolution of the effusion and hydrops CD collapsed	Asymptomatic at birth	—
17	Gardiner et al. (2009) [19]	14	2-3 mm	—	Apex RV	Normal	Pericardial effusion	TOP	—	—	—
18	Del Río et al. (2005) [18]	13	5 × 5	Female	Apex RV	46XX	Pericardial effusion, septal defect AV**	No	Spontaneous resolution at 28 w	Eutocic delivery 40 w; weight 3400 grams, asymptomatic at birth	Correction of septal defect at 3 months of life, resection of diverticulum; Asymptomatic at 8 months of life
19	Wax et al. (2007) [14]	20	6 × 9 mm	Male	Junction base RV-infundibulum	—	No	No	Stable	Full-term eutocic delivery; Weight 3689 grams, asymptomatic; small permeable FO	Asymptomatic at 18 months of life
20	Koshiishi et al. (2007) [17]	24	7 × 10 mm	—	Lateral wall below tricuspid valve (RV)	—	Mild pericardial effusion; MC pregnancy with laser intervention for TTTS at week 20 where donor fetus died	No	Stable	Prenatal fetal death at 29 w	—
21	Pradhan et al. (2007) [28]	28	—	—	Apex LV	—	Fetal arrhythmia Hydrops fetalis	Medical treatment (digoxin)	—	Vaginal delivery 40 w	Asymptomatic at 12 months of life

TABLE 2: Continued.

Author	GA di	Size	Sex	Location	Karyotype	Associated anomalies	Intervention	Prenatal progression	Neonatal	Follow-up
22 Barberato et al. (2009) [29]	16	5 × 5,7 mm	—	Apex LV	—	Mild pericardial effusion	PC 20 w	Discrete enlargement of PE with normal heart function	Prenatal fetal death 37 w	—
23 Barberato et al. (2009) [29]	30	12 × 13 mm	—	Mitral subvalvular	—	LV dilatation and reduced systolic function	No	Stable	—	Asymptomatic at 6 months of life
24 Davidson et al. (2009) [15]	20	—	—	Apex RV	—	Pericardial effusion	No	Spontaneous resolution	—	Surgical treatment
25 Abi-Nader et al. (2009) [2]	21	5 × 5,5 mm	Male	RV	—	Pericardial effusion	PC 24 w	Mild tricuspid regurgitation at 31 CD stable	Full-term delivery	Asymptomatic at a year of life
26 Perlitz et al. (2009) [30]	22	7 × 4 mm	Male	RV lateral wall	—	No	No	Stable, CD growth up to 9 × 9 mm	Eutocic delivery week 40; weight 4010 grams Asymptomatic at birth	Asymptomatic at a year of life
27 Menahem (2010) [31]	19	—	—	Apex LV	—	Pericardial effusion	—	No controls performed	Full-term live birth	Asymptomatic at 10 months of life
28 Carrard et al. (2010) [32]	13	2,6 × 2,9 mm	Male	RV lateral wall	46XY	First trimester NT 2.2 mm Pericardial effusion	PC 17 w	Resolution after PC; CD collapsed at 26 w	Eutocic delivery 40 w; 2780 grams	Asymptomatic at 11 months of life
29 Williams et al. (2009) [3]	22	3-4 mm	Male	RV	46XY	Pericardial effusion	PC 18 w	Reaccumulation after treatment and resolution at 32-33 w	PROM 34 w; intubation due to prematurity; caesarean section; weight 2460 gr; 2 muscle IVCs	Asymptomatic at 14 months of life
30 Williams et al. (2009) [3]	21	11 × 15 mm	Male	RV lateral wall below tricuspid valve	—	Isolated	—	—	Eutocic delivery; weight 2780 gr; asymptomatic at birth	Asymptomatic at 16 months of life
31 Williams et al. (2009) [3]	25	26 × 16 mm (37 s)	Male	RV	—	Arrhythmia and reduced systolic function	Induced delivery	—	Caesarean section 38 + 5 w; weight 3270 grams; mild reduction of systolic function and premature ventricular contractions at birth	Asymptomatic at 3 years of life, on prophylactic treatment with acetyl salicylic acid

TABLE 2: Continued.

	Author	GA di	Size	Sex	Location	Karyotype	Associated anomalies	Intervention	Prenatal progression	Neonatal	Follow-up
32	Paoletti and Robertson (2012) [20]	17	—	—	Apex LV	Normal	Mesocardia, per-membranous IVC	No	Stable	Full-term live birth	Asymptomatic at 2 years of life
33	Nam et al. (2012) [21]	21	1,6 × 0,4 mm	—	Apex LV	Normal	Defect on thoracoabdominal midline	TOP	—	—	—
34	Olorón et al. (2011) [22]	31	12 mm (postnatal)	—	RV lateral wall below tricuspid valve	—	—	No	Ventricular septal defect	Full-term live birth; asymptomatic at birth; symptoms at 45 days of life; closure of septal defect at 3 months of life	Asymptomatic at 10 months of life
35	Our case	14	2 mm	Male	Apex RV	46XY	Pericardial effusion	PC 17 w	PE resolution after treatment; CD Stable; moderate cardiomegaly; normal heart function	Full-term live birth; spontaneous eutocic delivery 40 + 1 w; weight 3150 grams	Asymptomatic at 4 years of life

GA di: gestational age at diagnosis; RV: right ventricle; LV: left ventricle; w: weeks of pregnancy; TOP: termination of pregnancy; PC: pericardiocentesis; CD: cardiac diverticulum; IVC: interventricular communication; PE: pericardial effusion; PROM: premature rupture of membranes; NT: nuchal translucency.

*Diagnosis was made during the pathological examination after death. **Diagnosis of the ventricular septal defect was made after birth.

TABLE 3: Management and outcomes of the cases with cardiac diverticulum and pericardial effusion.

	Reference	GA PE	GA di	Loc.	Size (mm)	Intervention	PE findings	Prenatal progression	Postnatal progression
1	Carles et al. [24]	13	—	Apex LV	—	TOP 14 w	—	—	—
2	Cesko et al. [25]	17	AP	Apex RV	3 mm	TOP 22 w	—	—	—
3	Gardiner et al. [27]	14	14	Apex RV	2-3 mm	TOP	—	—	—
4	Cavallé-Garrido et al. [6]	19	—	RV	3 mm	No	—	Spontaneous resolution at 34 w	Asymptomatic at 22 months
5	Cavallé-Garrido et al. [6]	20	—	LV lateral wall below mitral valve	large	No	—	Prenatal fetal death at 26 w, trisomy 18	—
6	Prefumo et al. [1]	12	12	Apex LV	1 mm	No	—	Spontaneous resolution, effusion disappeared at 14 weeks; CD was not visible on ultrasound examination from week 21	Asymptomatic at birth; effusion or diverticulum not visible Asymptomatic at 17-month follow-up
7	Del Río et al. [18]	13	13	Apex RV	5 × 5 mm	No	—	Spontaneous resolution; CD did not grow Perimembranous IVC	IVC and IAC (postnatal) Asymptomatic up to 3 months of age; surgical treatment Asymptomatic at 8 months of age
8	Davidson et al. [15]	20	20	Apex RV	—	No	—	Spontaneous resolution; CD did not grow	Surgical treatment at birth
9	Koshiishi et al. [17]	21	24	RV lateral wall	7 × 10 mm	No	—	Fetal death on week 29	—
10	Menahem [31]	19	19	Apex LV	—	No	—	No control performed	Full-term live birth; asymptomatic at 10 months of age; heart murmur; no treatment
11	Cavallé-Garrido et al. [6]	19	—	Apex RV	—	PC 20 w	—	No PE relapse, CD did not grow	Full-term live birth; asymptomatic at 12 months of age
12	Johnson et al. [16]	19	19	Apex RV	3 mm	PC 20 w	7 cm ³ yellow fluid, 20 gr/L proteins (transudate), acellular	No PE relapse, CD did not grow	Full-term live birth; asymptomatic at 16 months of age; no treatment
13	Bernasconi et al. [26]	22	AP	Pared lateral LV	10 × 5 mm	PC 25 w	25 mL old blood fluid (CD rupture)	Intrauterine fetal death at 26 weeks (CD rupture)	—

TABLE 3: Continued.

Reference	GA PE	GA di	Loc.	Size (mm)	Intervention	PE findings	Prenatal progression	Postnatal progression
14 McAuliffe et al. [27]	13	13	Apex RV	4 × 6 mm	PC 16 w	3 mL serohematic fluid, 18 gr/L proteins (transudate), lymphocytes and mesothelial cells	No PE relapse or enlarging; CD was not visible on week 37	Full-term live birth; asymptomatic at 10 months of age; no treatment
15 McAuliffe et al. [27]	13	13	Apex RV	4 × 3 mm	PC 14 w	0.8 mL serohematic fluid, 15 gr/L proteins (transudate)	No PE relapse; CD did not grow	Full-term live birth; asymptomatic at 8 months of age; no treatment
16 Prefumo et al. [1]	14	14	Apex RV	5 × 5 mm	PC 16 w	5 mL clear fluid	No PE relapse; CD did not grow; mild cardiomegaly	Full-term live birth; asymptomatic at 22 months of age; no treatment
17 Gardiner et al. [19]	14	14	Apex RV	2-3 mm	PC 14 w	2 mL yellow fluid	No PE relapse; CD did not grow	Full-term live birth; asymptomatic; no treatment
18 Carrard et al. [32]	13	15	Apex RV	2.6 × 2.9	PC 17 w	4 mL clear fluid, 21 g/L proteins (transudate)	No PE relapse; diverticulum was not visible from week 26 on	Full-term live birth; asymptomatic at 11 months of age; no treatment
19 Abi-Nader et al. [2]	21	21	Apex RV	5 × 4.5	PC 24 w	Yellow fluid 10 mL, 15.4 g/L proteins (transudate), lymphocytes	Complete resolution one week after PC; CD did not grow	Full-term live birth; asymptomatic at one year of age; no treatment
20 Barberato et al. [29]	16	16	—	—	PC 20 w	Blood-stained fluid	Moderate growth of PE size as compared with postpuncture effusion; expectant approach; intrauterine fetal death on week 37	—
21 Williams et al. [3]	12	22	Apex RV	—	PC 18 w	—	Relapse one week later and subsequent spontaneous resolution on week 32-33	—
22 Our case	12	14	Apex RV	2 mm	PC 17 w	Clear yellow fluid, acellular, transudate	No PE relapse; CD did not grow	Full-term live birth; asymptomatic at birth; treatment with ASA; asymptomatic at 4 years of age

GA PE: gestational age at pericardial effusion; GA di: gestational age and diverticulum diagnosis; RV: right ventricle; LV: left ventricle; w: weeks of pregnancy; PC: pericardiocentesis; CD: cardiac diverticulum; IVC: interventricular communication; PE: pericardial effusion.

References

- [1] R. G. Rodriguez, A. R. Guedes, R. G. Delgado, L. R. Gutierrez, M. M. Castellano, and J. A. G. Hernandez, "Prenatal diagnosis of cardiac diverticulum with pericardial effusion in the first trimester of pregnancy with resolution after early pericardiocentesis," *Case Reports in Obstetrics and Gynecology*, vol. 2015, Article ID 154690, 11 pages, 2015.