Contegra® Pulmonary Valved Conduit H020003

Presentation to the Pediatric Advisory Committee
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Dora Vega, MD, PhD
Division of Epidemiology
Office of Surveillance and Biometrics
Center for Devices & Radiological Health

Device Description

- A glutaraldehyde-crosslinked, heterologous bovine jugular vein with a competent tri-leaflet venous valve

- Indications for Use

  Correction or reconstruction of the right ventricular outflow tract (RVOT) in patients aged < 18 years with any of the following congenital heart malformations

  - Pulmonary Stenosis (PS)
  - Tetralogy of Fallot (TOF)
  - Truncus Arteriosus (TA)
  - Pulmonary Atresia (PA)
  - Transposition with Ventricular Septal Defect (VSD) , and

  – Replacement of previously implanted, but dysfunctional, pulmonary homografts or valved conduits

Annual Distribution Numbers

- The HDE Annual Distribution Number (ADN) is currently defined as the number of devices reasonably needed to treat, diagnose, or cure a population of 8,000 individuals in the United States
  - The ADN for Contegra is 4,000 (based on original device approval)
- Since the last PAC review
  - 372 sold
  - 172 implanted: at least 163 implanted in pediatric (<22 year old) patients

Medical Device Report (MDR) Review

- Date: 06/01/16 – 05/31/17
- 109 MDRs: **84 unique events**: 1 death (pediatric), 83 injuries

Demographic Data		Value	MDRs containing demographic
Country	US : OUS	89% : 11%	75 : 9 (84 Total)
Patient Gender	Male : Female	60% : 40%	50 : 34 (84 Total)
Patient Age	Pediatric : Adult	98% : 2%	**81** : 2 (83 Total)
Pediatric patients: Age Range:1 month – 20 years Average Age: 9.8 ± 5.3 years			

MDR: Primary Reported Event

by Patient Age and TTEO*

(MDR Date: 06/01/16 – 05/31/17)

Primary Reported Event	MDR (n)	MDR by Patient Age (year)			TTEO (month)	
		Pediatric (< 22)	Adult (≥ 22)	Age not reported	Range	Mean
Stenosis	37	36	1		3 --- 160	73
Device replaced (reason not provided)	35	34		1	3 --- 158	71
Regurgitation	5	4	1		50 --- 136	87
Arrhythmia	2	2			0 --- 0.3	0.15
Aneurysm	1	1			17	.....
Infection/Endocarditis (1 Death)	2**	2			0.5 --- 37	19
Increased pressure gradient	1	1			133	.....
Thrombus	1	1			0.07	.....
Total	84	81	2	1		

* Time to Event Occurrence (TTEO)

** One MDR involved a potential tracheal compression. A total of 83 MDRs were injuries.

MDR: Potential Tracheal Compression

Case Summary ***(Updated on 9-8-2017)***

- Male neonate with a history of Truncus arteriosus type II corrected with a 14 mm Contegra implant and Rastelli procedure
- Conduit replaced with a 12 mm Contegra for unclear reasons 2 weeks after first implant
  - Issues reported included high airway pressure, and suspected tracheal compression
- Patient expired 6 days after Contegra replacement
- Cause of death: Pneumonia and Sepsis (unrelated to Contegra)

MDR: Primary Reported Problem

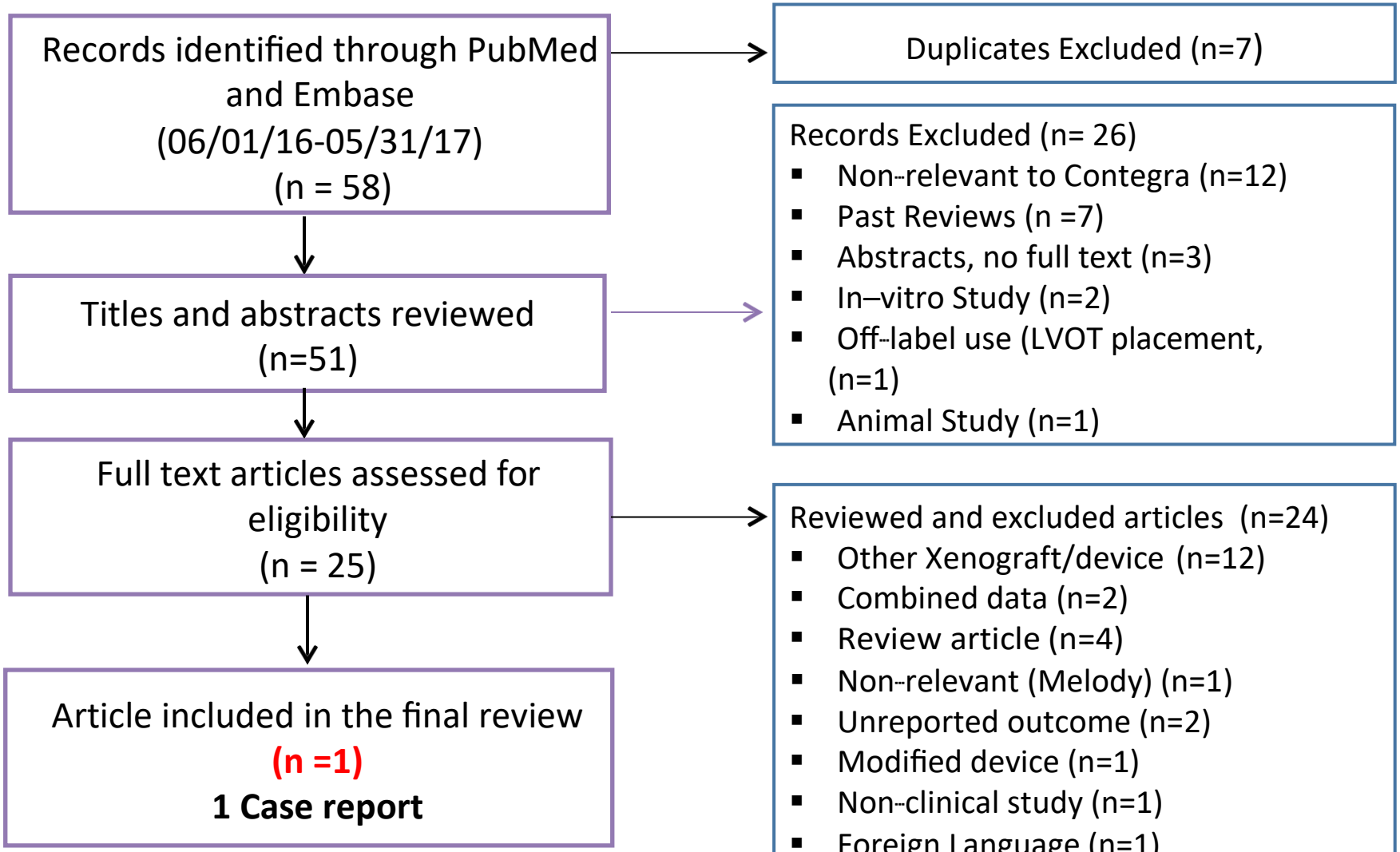
Comparison of MDRs – 2016 and 2017

Primary Reported Event	2016 PAC	2017 PAC
	MDR Count (%)	MDR Count (%)
Stenosis	28 (48 %)	37 (44 %)
Device replacement (reason not provided)	22 (38 %)	35 (42 %)
Regurgitation	2 (3.4 %)	5 (6 %)
Arrhythmia	0	2 (2.3 %)
Aneurysm	0	1 (1.3 %)
Infection/Endocarditis*	2 (3.4 %)	2 (2.3 %)
Increased pressure gradients	1 (1.7 %)	1 (1.2 %)
Thrombus	0	1 (1.2 %)
Conduit tear/breakdown	2 (3.4 %)	0
Device sizing issue	1 (1.7 %)	0
Total	**58**	**84**

*. One MDR involved a poten)al tracheal compression.

Literature Review

Article Selection



Case Report – 1 patient
Falchetti et al. 2016

Contegra 12 mm: How Long Can It Last? World J for Pediatric and Congenital Heart Surgery. 2016

Belgium

16 years freedom from failure -12 mm Contegra

Background -Pre-implantation

- **Patient:** 4 mo. old female (wt. 3kg) referred from another country with Type 1 TA, large VSD, RVH, right-sided aortic arch, grade 2/4 valve regurgitation, and well developed PA branches
- **Implantation and Hospital Course:**
  - RVOT reconstruction with **12 mm Contegra**
  - Main PA diameter measured 9 mm
  - PA diameter mismatch results in Z-score of + 2.5
  - Patient discharged POD16 for follow-up at referring country

TA= truncus arteriosus, VSD= ventricular septal defect, RVH= right ventricular hypertrophy, PA = pulmonary artery, PH = pulmonary hypertension, POD= post operation date

16 years -Post-implantation

- Referred for reoperation due to conduit failure
- Healthy female : wt. 33kg/73 lbs; ht.156 cm/5'2"
- TTE: competent truncal valves, conduit stenosis, 110 mm Hg RVOT gradient , no regurgitation, and normal RV and LV function
- CT scan: conduit diameter shrinkage to 9 mm and calcification
- Replaced with a 22 mm pulmonary homograft

Potential factors contributing to 16 years of freedom from failure

- Moderate oversizing: Z score of +2.5
- Suturing technique: Distal everting suture, potentially contributing to avoidance of distal stenosis

RH= right heart, RVOT= right ventricular outflow tract, RV= right ventricle, LV= left ventricle, TTE= Transthoracic Echocardiography, CT= computed tomography

FDA Conclusions

- MDR data review identified a case of conduit replacement for unclear reason(s). The FDA believes that currently there is insufficient information to determine if this was a case of tracheal compression due to the device

- Other Adverse Events reported in MDRs are known events addressed in the device IFU

- No new concerns were reported in the literature

FDA Recommendations

- FDA will continue the conversation with the manufacturer for additional information regarding the suspected case of tracheal compression
- FDA will continue device surveillance and report the following to the PAC in 2018:
    - Device Annual Distribution Numbers
    - MDR Data
    - Literature Review

Questions to the PAC

1. Does the Committee agree with CDRH's conclusions and recommendations about surveillance and report of ADN, MDRs, and literature review?

2. Does the Committee have any additional comment(s)?

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Greg O'Connell

Nadezda Radoja

Erika Tang

Dora Vega*

Aron Yustein

Office of the Center Director

Nia Benjamin*

Vasum Peiris

Victoria Wagman

Office on Pediatrics and Therapeutics

Judith Cope,

Robert "Skip" Nelson

Amy Odegaard

Kenneth Quinto

Pam Weinel

(*) Slides prepared by


FDA
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