

## The role of 64-Slice Cardiac Computed Tomography in Diagnostics of Transposition of the Great Arteries

**Poster No.:** P-0009  
**Congress:** ESCR 2016  
**Type:** Scientific Poster  
**Authors:** T. Dautov, F. Bayembayev, B. Duisenbayeva, M. Kondybayev, A. Zhampiisova; Astana/KZ  
**Keywords:** Cardiac, Cardiovascular system, Contrast agents, CT, CT-Angiography, Echocardiography, Surgery, Computer Applications-Detection, diagnosis, Contrast agent-intravenous, Congenital, Outcomes

Any information contained in this pdf file is automatically generated from digital material submitted to EPOS by third parties in the form of scientific presentations. References to any names, marks, products, or services of third parties or hypertext links to third-party sites or information are provided solely as a convenience to you and do not in any way constitute or imply ECR's endorsement, sponsorship or recommendation of the third party, information, product or service. ECR is not responsible for the content of these pages and does not make any representations regarding the content or accuracy of material in this file.

As per copyright regulations, any unauthorised use of the material or parts thereof as well as commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method ist strictly prohibited.

You agree to defend, indemnify, and hold ECR harmless from and against any and all claims, damages, costs, and expenses, including attorneys' fees, arising from or related to your use of these pages.

Please note: Links to movies, ppt slideshows and any other multimedia files are not available in the pdf version of presentations.

[www.myESR.org](http://www.myESR.org)

## Purpose

The ability of 64-slice cardiac computed tomography (CT) of the diagnostics of the Transposition of Great Arteries (TGA) was evaluated. In this observational study we aimed to identify the sensitivity and specificity of CT as compared to echocardiography (ECHO) and invasive cardiac catheterization.

## Methods and Materials

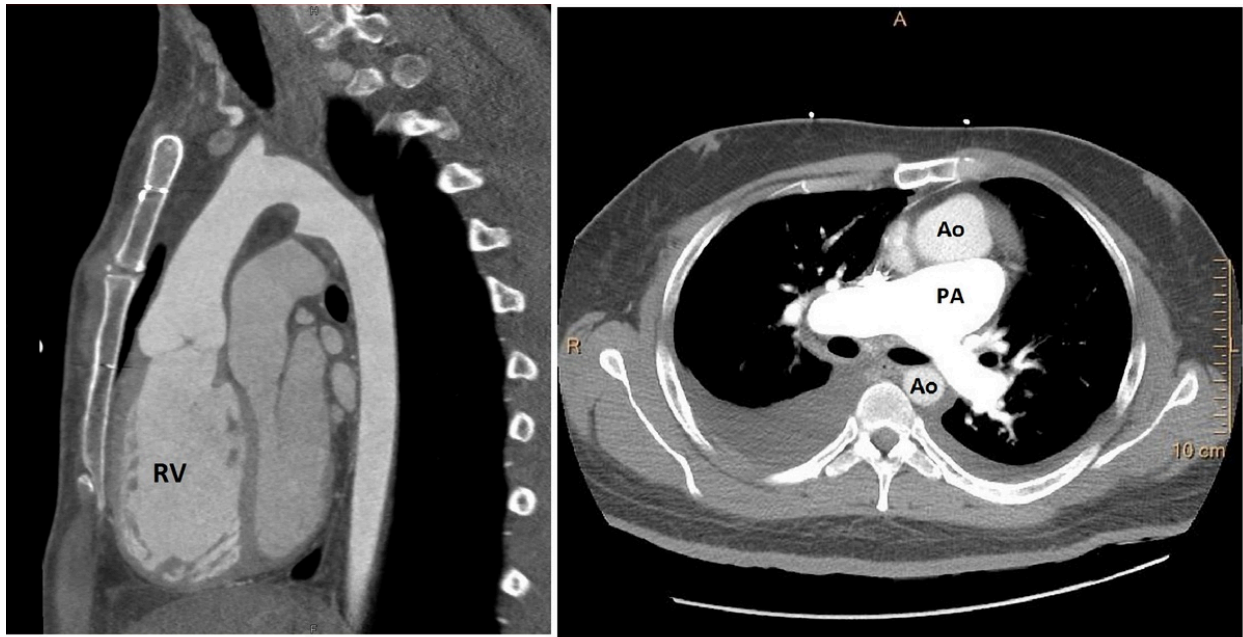
The retrospective study was performed at National Cardiac Surgery Center in Astana, Kazakhstan, within October 2011 - December 2015. Eighty six patients with congenital heart disease expected to have TGA (age 0 - 30), underwent conventional echocardiography and Cardiac CT using the 64-slice scanner with prospective ECG-synchronization and slice thickness reconstruction of 0,6 mm. Some patients experienced invasive cardiac angiography. In 80 patients TGA was proved, including 61 D-TGA (79%) and 19 L-TGA (21%). The potential of CT to detect and distinguish both types was analyzed by performing and comparing different studies in sequence. MSCT scanning was performed during breathing and after sedation in infants. Contrast medium (2-4 ml/kg) was administered through an arm vein in all patients.

**Images for this section:**



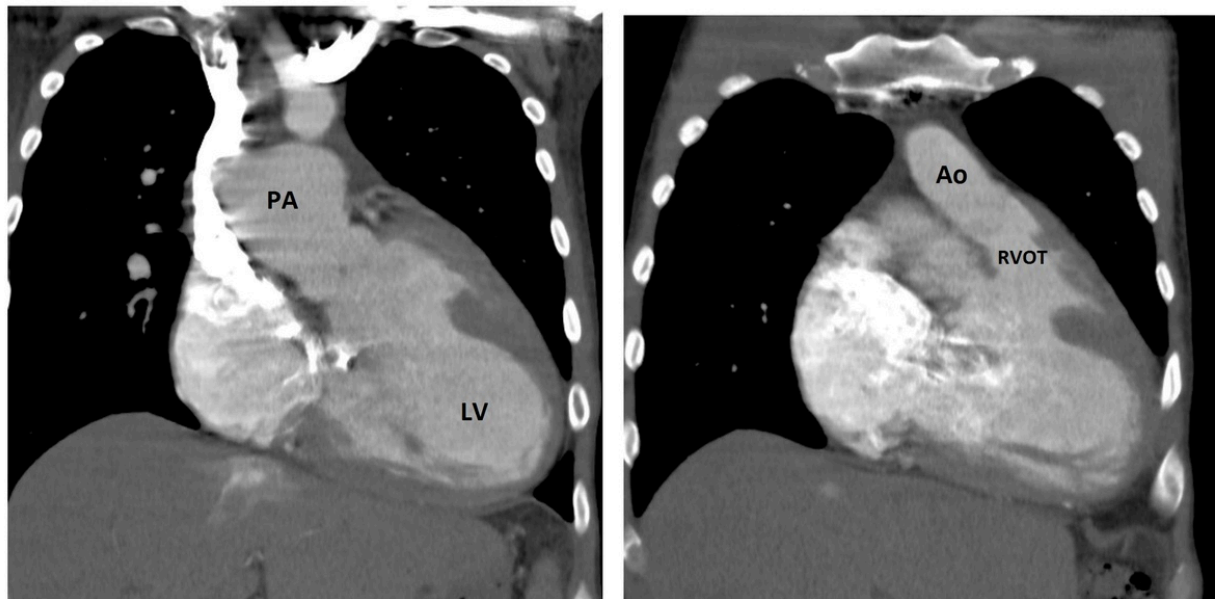
**Fig. 3:** There is narrowing of the superior mediastinum as result of the aortic and pulmonary arterial configuration, i.e. parallel in D-loop transposition, with the main pulmonary artery posterior to the aorta.

© Radiology, National cardiac surgery center - Astana/KZ



**Fig. 1:** D-TGA (saggital & axial)

© Children's Hospitals and Clinics of Minnesota 920 East 28th St Suite 300, Minneapolis Minnesota, USA



**Fig. 2:** D-TGA (coronal)

© Radiology, National cardiac surgery center - Astana/KZ

## Results

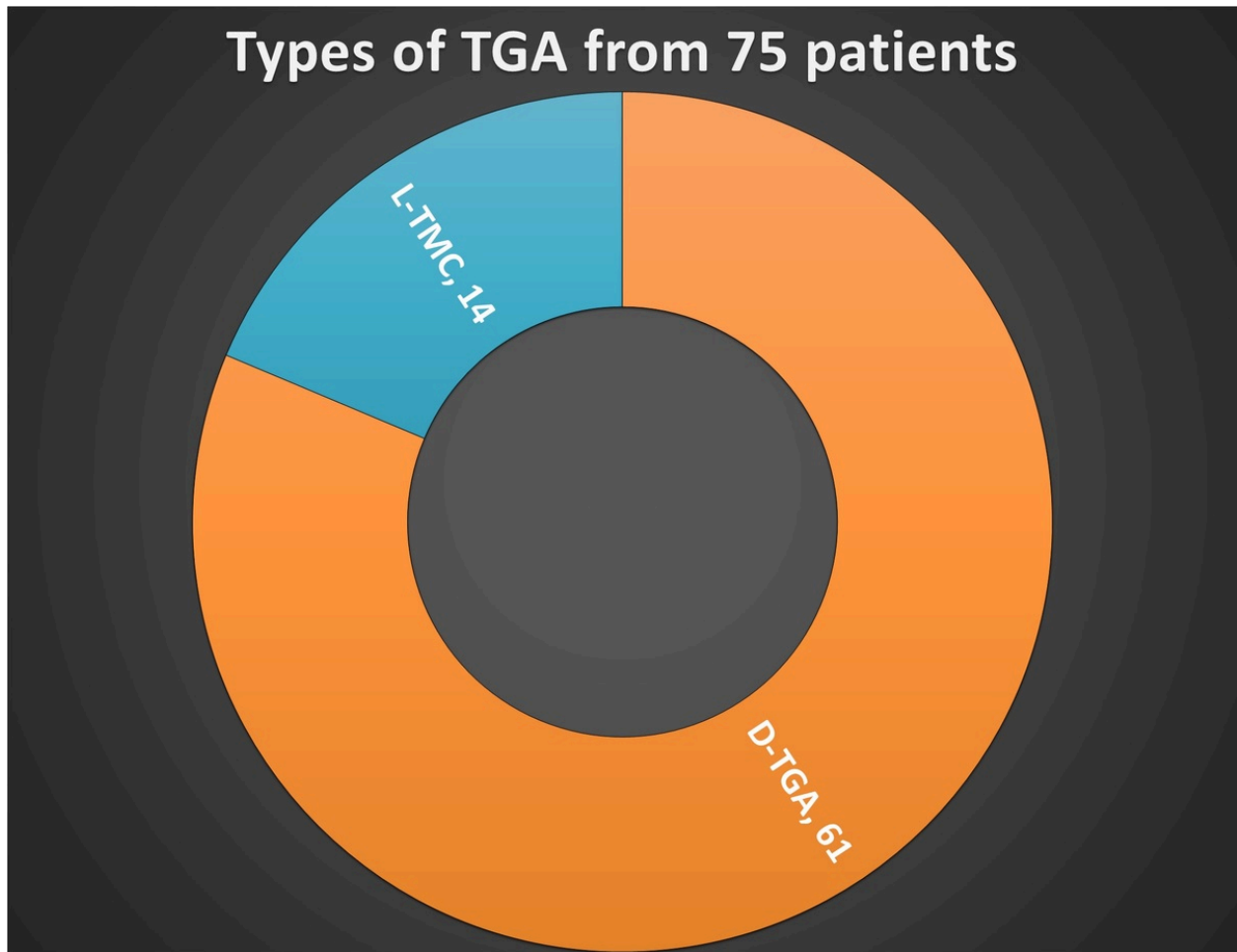
MSCT correctly detected TGA in 75 patients (93,75%) out of 80 in whom surgeon or invasive cardiac catheterization had identified TGA, with a sensitivity, specificity and negative predictive value of 100%. 5 cases of false negative results were received, which were confirmed on ECHO subsequently.

- Results of CT and ECHO matched in 69 (92%) patients.
- Gender ratio presents predominance of 45 (60%) males over 30 (40%) females.
- 61 patients (79%) had D-TGA (21%) and 14 patients had L-TGA only.
- The majority of patients have been identified under the age of 1 month.
- 61 patients (79%) had D-TGA (21%) and 14 patients had L-TGA only.
- 64(85%) patients from 75 were operated, but in 11(14%) from them died.

In all 75 patients TGA combined with different **CHD**, such as

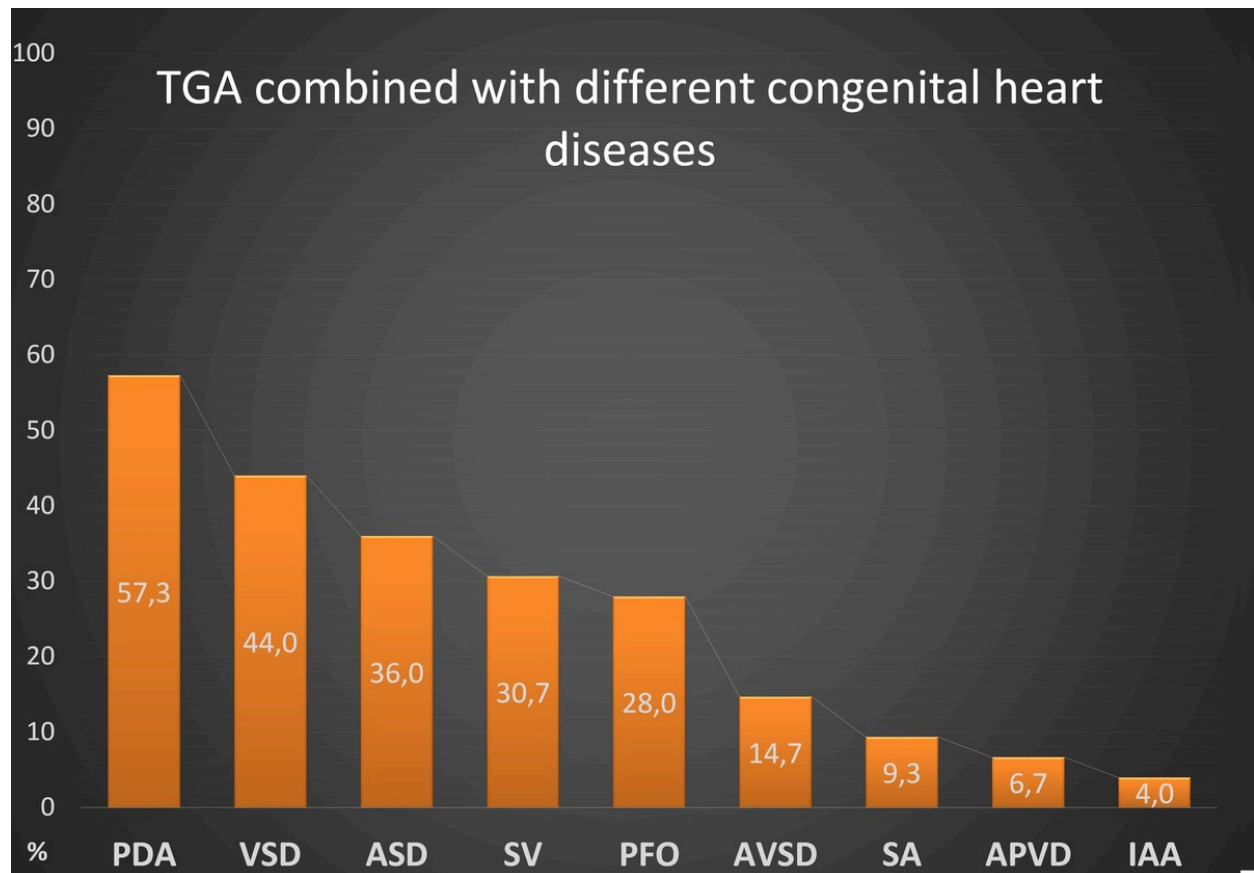
1. Patent ductus arteriosus (**PDA**) in 43 patients(61.4%)
2. Ventricular Septal Defect (**VSD**) in 33 patients(57.3%)
3. Atrial Septal Defect (**ASD**) in 27(44.0%)
4. Single ventricle (**SV**) in 23(30.7%)
5. Patent foramen ovale (**PFO**) in 21(28.0%)
6. Atrioventricular septal defect (**AVSD**) in 11(14.7%)
7. Single atrium (**SA**) in 7(9.3%)
8. Anomalous pulmonary venous drainage (**APVD**) in 5(6.7%)
9. Interrupted aortic arch (**IAA**) in 3 cases(4%).

Images for this section:



**Fig. 4:** Types of TGA

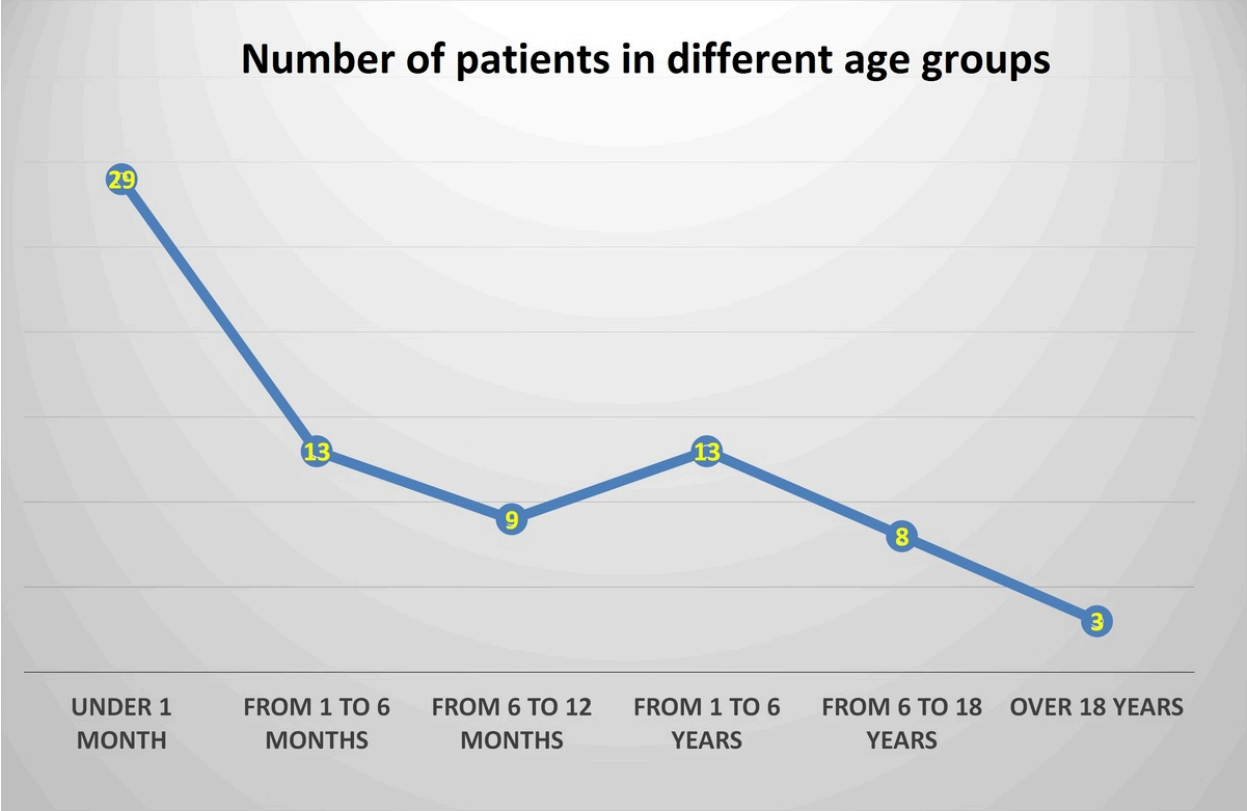
© Radiology, National cardiac surgery center - Astana/KZ



**Fig. 5:** Combination of TGA with different CHD

© Radiology, National cardiac surgery center - Astana/KZ

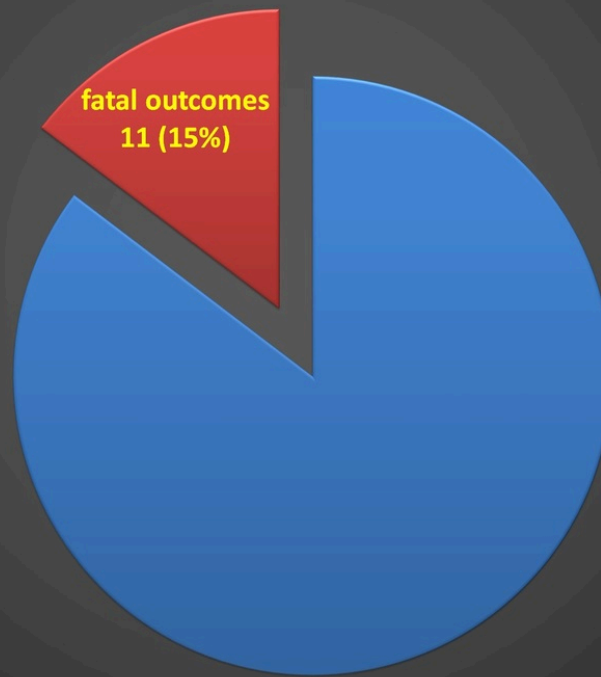




**Fig. 6:** The age of patients

© Radiology, National cardiac surgery center - Astana/KZ

## 64 patients were operated



**Fig. 7:** Operation results

© Radiology, National cardiac surgery center - Astana/KZ

## Conclusion

64-slice Cardiac CT performs as well as echocardiography in the majority of children who have TGA. Sensitivity of 93,75% and specificity of 99.34%, shows a fairly good level. CT also provides detailed information on the types of TGA and another CHD. However, to increase the proportion of correct diagnostic results, CT and Echo should complement one another.