



Surgery

A NEW CLASSIFICATION FOR CONGENITAL HEART ANOMALIES:
RPKSAI CHACS

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ABSTRACT

Congenital heart diseases can vary from simple to quite complex malformations. A classification that takes into consideration all the nuances of this complex scenario is the need of the hour, particularly when artificial intelligence-based algorithms need proper documentation and analysis of data. A new classification that would serve this purpose of capturing the complexity of congenital heart anomalies in a precise fashion enabling proper communication and works alongside the currently available platforms is envisaged herewith. RPKSAICHACS (RPKSAI Congenital Heart Anomaly Classification System) essentially is designed with this purpose in mind with categorisation under six major criteria of looping pattern, septation, chamber formation, valve anomalies, vascular malformations, and additional anomalies. These categories and subcategories are represented by simple alphabets which is added to the major defect to complete the anomalies detected. Universal recognition with refinement and validation is expected in future. This is an all-inclusive simple classification of a complex congenital scenario.

KEYWORDS :**INTRODUCTION**

Congenital Heart Anomaly Classification System (RPKSAI-CHACS) Here component one is the looping pattern represented by L. In looping pattern, the normal D loop is represented as D and normal L Loop is represented as L. D loop reversal is represented as DR and L loop reversal as LR. Incomplete looping is represented by IL while Excessive looping by EL. When exemplifying and coding are discussed later in this article the picture would be clearer.

Component two of the classification system looks at the septation represented by S. Normal septation would be classified as NS, while abnormal septation as AnS. Ventricular septal defect as VS and atrial septal defect as AS.

Component three looks into chamber formation represented by Normal chamber formation as NC and abnormal chamber formation as AC. SV is single ventricle and DORV is double outlet right ventricle and DOLV is double outlet left ventricle.

Component four includes all valve abnormalities categorised as VA with the letter N stating if the valve is normal, TA for tricuspid atresia, PA for pulmonary atresia, AA for aortic atresia, MA for mitral atresia.

Component five is vascular anomalies or malformations (VM). Normal vascular pattern as NV, Transposed Great arteries as TGA, PDA being patent ductus arteriosus, COA being Coarctation of aorta, IAA being interrupted aortic arch.

Category six includes additional anomalies as AA, Categorisation here would be CA for coronary anomalies, CT for cardiac tumours, CC for cardiac cysts, OA for other mentioned anomalies.

ALGORITHM OR TECHNIQUE OF NEW CLASSIFICATION RPKSAI - CONGENITAL HEART ANOMALY CLASSIFICATION SYSTEM (CHACS)

Component 1:

- Looping Pattern (LP)
- D-Loop (Normal): D
- L-Loop (Normal): L
- D-Loop Reversal: DR
- L-Loop Reversal: LR
- Incomplete Looping: IL
- Excessive Looping: EL

Component 2:

- Septation (S)
- Normal Septation: NS

- Ventricular Septal Defect (VSD): VS
- Atrial Septal Defect (ASD): AS
- Abnormal Septation: AnS

COMPONENT 3: CHAMBER FORMATION (CF)

- Normal Chamber Formation: NCF
- Abnormal Chamber Formation: AC
- Single Ventricle: SV
- Double Outlet Right Ventricle (DORV): DORV
- Double Outlet Left Ventricle (DOLV): DOLV

COMPONENT 4: VALVE ANOMALIES (VA)

- Normal Valves: NV
- Tricuspid Atresia (TA): TA
- Pulmonary Atresia (PA): PA
- Aortic Atresia (AA): AA
- Mitral Atresia (MA): MA

COMPONENT 5:**VASCULAR MALFORMATIONS (VM)**

- Normal Vascular Pattern: NV
- Transposition of the Great Arteries (TGA): TGA
- Patent Ductus Arteriosus (PDA): PDA
- Coarctation of the Aorta (COA): COA
- Interrupted Aortic Arch (IAA): IAA

COMPONENT 6:**ADDITIONAL ANOMALIES (AA)**

- Coronary Artery Anomalies: CA
- Cardiac Tumours: CT
- Cardiac Cysts: CC
- Other Anomalies: OA

CLASSIFICATION FORMAT:

- Use a combination of letters to represent a specific congenital heart anomaly. For example:
- TGA with D-Loop Reversal, Excessive Looping, and Abnormal Septation: DR + EL + AS + TGA
- DORV with D-Loop Reversal, Incomplete Looping, and Abnormal Chamber Formation: DR + IL + AC + DORV

EXAMPLE CODES:

- DR + EL + AS + TGA (Transposition of the Great Arteries)
- LR + IL + AC + DOLV (Double Outlet Left Ventricle)
- DR + IL + EL + AS + AC + TOF (Tetralogy of Fallot)
- LR + EL + AS + AC + PA (Pulmonary Atresia)

DISCUSSION.

Example codes clearly shows that the classification though extremely simple captures the complexity of congenital heart anomalies. This allows for a precise classification and communication. Format clearly is designed with artificial intelligence concepts that is user friendly for data analysis and facilitates research. It can be used in conjunction with any of the current classification system as it is not contradictory to any of the earlier classification schemes. Future nuances would be just addition of very rare anomalies under OA category and scheme is suitable for any future revision and validation. It would soon be recognised as a universal classification in view of its simplicity and complete documentation.

SUMMARY

RPKSAICHACS is an advanced Congenital Heart Anomaly Classification System with a comprehensive framework that categorizes complete spectrum of congenital heart defects. Clinicians and surgeons can precisely classify these complex defects and communicate in a more effective manner facilitating research and data analysis and is suitable for any future Artificial Intelligence program algorithms.

CONFLICT OF INTEREST

None

ETHICAL ISSUES

NA

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SUGGESTED ONLY FOR FURTHER READING

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