

# Congenital Heart Surgery. The (personal) rookie's perspective

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Since I started Medical School, I have always been dreaming about being a Congenital Heart Surgeon. As a student, I was fascinated by the way these fancy hearts could always find how to “pay their dues”, whatever the anatomy, the disrupted physiology or the anomalies of the surrounding structures. They keep beating at their own rhythm, reaching a special, even if unstable, balance.

As a young resident, I get somehow surprised almost every time I scrub in the OR on a Congenital Case. Only once in a blue moon, in the most complex defects, the setting is the one you expected from the echocardiogram or the other previous investigation. You must keep your wits all the time, investigate again all the structures, reconsider the pattern, the relationships and the continuously changing vital parameters. It is not uncommon to start from scratch by a “new” intraoperative diagnosis, which forces the surgeon to think twice and perhaps change the planned strategy.

Indeed, lifelong learning is key to develop any medical career, regardless of the practice field, specialty or academic expectations [1]. This couldn't be more plain when moving the first steps in the sophisticated yet charming world of Pediatric Cardiac Surgery.

Being on the ball is anything but easy! Likewise, if it's true that “knowledge is power”, doubts and questions dominate the mind of the rookie Congenital Heart Surgeon (at least, mine!), no matter how many books, articles or surgical videos have been already read or watched.

Isn't funny how easy is it to start wandering about the simplest definitions?

“What is a ventricle?” – was my issue once we were operating on a child to complete the Fontan circulation pattern. His surgical and echocardiographic diagnosis was “univentricular heart of indeterminate type”. Confusion about the exact meaning of the word “indeterminate” immediately emerged. At first, reading the Paper by Frescura et. al [2], I found the following definition: «a main ventricular chamber which can't be classified either as right or left because the ventricular septum failed to develop».

So far, so good? Not at all! Here all the question marks rose:

1) which are the main characteristics of “univentricular hearts of indeterminate type” (anatomically and morphologically speaking), such that they can't be classified either as right or left?

2) how can we best describe the atrio-ventricular (AV) and ventricular-arterial (VA) connections in this setting?

My feeling was that in this context is quite hard to avoid muddle using the terms “right” or “left”

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to refer both to the ventricles and the AV valves. Furthermore, my idea was supported by professor Anderson's statement I met in the Manuscript "Sequential Segmental Analysis" [3]: «When describing atrioventricular valves, the adjectives mitral and tricuspid are strictly accurate only in hearts with biventricular atrioventricular connections having separate junctions, each guarded by its own valve. In this context, the tricuspid valve is always found in the morphologically right ventricle, and the mitral valve in the morphologically left ventricle».

Thus, the shy, lean and mean bookworm began again chewing on a bone. To be honest, the first results were as clear as mud. Anyway, since I judged of paramount importance to hit the nail on the head, I kept working. Doing so, I bumped in two articles which shared the title with my main concern: "What is a ventricle?", the first one by Anderson [4], the second by Van Praagh [5]. I was somehow surprised and excited to have almost the same authors' insights about the definition of "a ventricle". They both came to the conclusion that ventricles are not diagnosed and named in terms of the entering or exiting AV or VA valves, respectively, but by their gross myocardial morphological characteristics, simply applying the morphological method of diagnosis and naming of the cardiac chambers introduced by Lev [6]. Therefore, to answer the first question, «a solitary and indeterminate ventricle can be found in the situation in which the apical component is uniformly coarse, much coarser than a dominant right ventricle» [4]. Likewise, Van Praagh superbly and unknowingly solved my point about the AV and VA connections, affirming that «the definition of single ventricle is not a satisfactory paradigm for the diagnosis and naming of the ventricles, because the AV valves can have virtually any connection with the ventricles» [5].

Getting back to the heart of the matter, mine was certainly not a new finding or the place to start a surgical revolution, but anyway food for thought. I realized what two "giants" had already appreciated,

completely on my own, just being focused before, during and after an operation. It was like discovering a diamond in the rough.

The power to turn you full of the joys of the spring, with an increasing hunger to improve and expand your knowledge base and practical skills is something I deem to be magical and inspiring in Congenital Heart Surgery. In the pursuit of reaching the highest level, this driving force has a priceless value to deal with the conflicting desire to operate with the frequency and enthusiasm that defines fellowship [1] and the disappointing as much as concrete struggle of being a Pediatric Cardiac Surgeon at the present time.

At the annual meeting of the Congenital Heart Surgeons' Society during the last fall, Dr. William Norwood received a lifetime achievement Award and commented that «Congenital Heart Surgery may be the most difficult specialty in medicine». We must agree upon this perception and what recently argued by dr. Fraser [7], that «Pediatric Heart Surgery in the current era is not only hard to get to do, it is hard to do». The young surgeon is pushed since the very beginning of the career to achieve perfect results in the scenario of a mounting complexity of congenital pathologies and patient's, cardiologists' and familial expectations. In addition, new technology, evolving advancement in surgical outcomes and health services research, and improvements in clinical practice and innovation have dramatically expanded the foundation of knowledge expected during training [1]. Although facing this huge pressure can be very demanding, it is however my belief that a fair amount of ambition and passion is definitely the bedrock to succeed. Hence, it is the exhaustive dedication that can light the fire under the fledgling trainees. It is also undoubtedly through this commitment that Junior surgeons can find time and energy, even after a long and hardworking day, to invest on reading, studying and drawing, for example, as in my personal case.

If stay up-to-date is a crunch time during Resi-

dency experience, staying enthusiastic is indeed the secret, not only as trainees but even more for one's entire career.

When it seems, I'm trying to get blood out of a stone holding on the wish of becoming a Congenital Heart Surgeon, I just bear in mind the words of a sage: «It's kind of fun to do the impossible » [Walt Disney].

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