

To save Blue Babies: The 80th anniversary of the first Blalock–Thomas–Taussig shunt and the 70th anniversary of the first successful tetralogy of Fallot repair

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In 1924, Maude Abbott, a Canadian physician, coined the term “tetralogy of Fallot” (ToF), referring to a congenital heart condition first mentioned in 1671 by Nicolaus Steno (Niels Stensen), a Danish scientist, and, 217 years later, described in detail by Étienne-Louis Arthur Fallot, a physician from Marseille, France [1].

In the 1930s, Helen Taussig, a pediatric cardiologist from the Johns Hopkins University Hospital, noticed that a patent ductus arteriosus coexisting with ToF protects the child against cyanotic anoxic attacks. In 1938, Robert Gross from Boston successfully ligated a patent ductus arteriosus in a 7-year-old Lorraine Sweeney. One year later, Helen Taussig asked him to create a kind of duct to improve pulmonary flow in children with congenital heart defects and impaired pulmonary blood flow. But Robert Gross answered that he was interested exclusively in closing the duct, not in opening it. Several years later (just after the success of a team Blalock–Thomas–Taussig [BTT]), he admitted that it had been the stupidest statement he had ever said [1].

Eileen Saxon was born with ToF 5 weeks before the delivery term. On November 29, 1944, at the age of 15 months, she became the first child in the world with systemic pulmonary shunt. The connection between the subclavian artery and the pulmonary artery had been developed by Vivien Thomas and performed by Alfred Blalock (inspired by Helen Taussig), hence the name the BTT shunt [2].

Seventy years ago, Walton Lillehei (called “King of Hearts”) performed at the University of Minnesota Hospital the first-ever successful repair of ToF on a 10-year-old boy. “Cross-circulation” was a technique used, with possibly 200% mortality (of patient and donor). There

were 10 children with ToF/pulmonary atresia in the group of 45 children operated on in 1954–1955, and the first patient with ToF was the 14th one to have the landmark procedure. Lillehei performed it on August 31, 1954. The child, Michael Shaw, had a rare blood group AB Rh negative, and his father could not be involved. The circulation was provided by Howard Holtz, then a 29-year-old father of three children. He had the same blood type and had been a donor in the past. A donor of blood — but not of the entire circulation. And yet, Howard Holtz, despite the enormous risk, accepted Lillehei’s proposal [1].

In April 1955, Lillehei, during his lecture at a meeting of the American Surgical Association, boasted about his successful operation on a patient with ToF. Someone said that it sounded like Jules Verne’s fantasies. Alfred Blalock was the first to start the discussion by saying: “I must say that I never thought I would live to see the day when this type of operative procedure would be performed. I want to commend Dr. Lillehei and Dr. Varco and their associates for their imagination, their courage, and their industry” [1].

Howard Holtz survived the procedure; he lived to the ripe old age of 90. Michael Shaw also survived the operation and did not require any medication for several decades after the procedure. In 1990, Walton Lillehei described the fate of his landmark patient. Mike Shaw was doing well for 35 years after this breakthrough procedure; he was a father of 4 children and a successful musician. Lillehei was worried because his patient smoked over a pack of cigarettes a day for 30 years [3]. “King of Hearts” would be very surprised if he learned that in 2024 (i.e., a quarter of

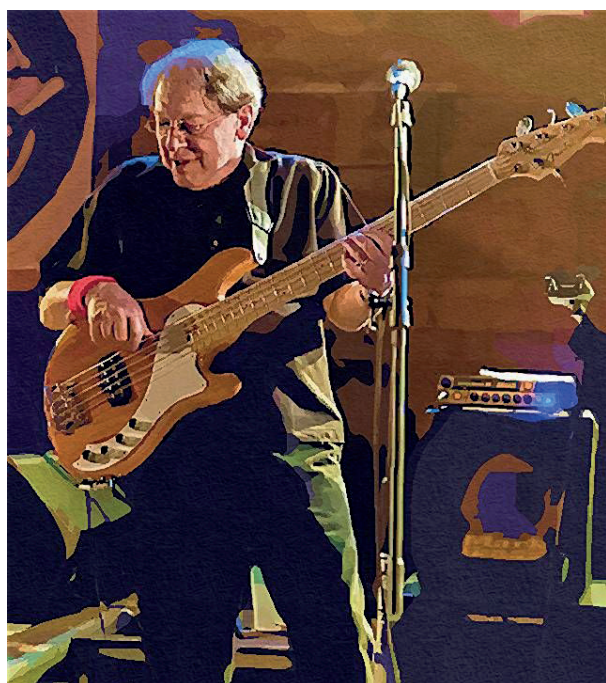


Figure 1. Michael Shaw — the world's first patient with tetralogy of Fallot operated successfully in 1954 (courtesy: Mike Shaw)

a century after Lillehei's death), his first ToF patient is still alive (70 years after the world's first successful ToF repair). Mike Shaw is now 80 years old (Figure 1).

Walton Lillehei was not afraid to be the first; he chose paths that others avoided. He used to say: "Some see things as they are and ask: Why change? Others dream of things that never were and ask: Why not?" Lillehei's achievements did not go unnoticed; they brought him fame, and cardiac surgeons from all over the world were coming to Minneapolis for internships. Among these physicians, there was a Polish surgeon, Dr. Wiktor Bross, who later performed the first in Poland open heart surgery (1958) and one of the first ToF repairs (Figure 2). The first successful ToF surgery in Poland was performed by Leon Manteuffel-Szoego (February 24, 1964).

This year, we celebrate the 70th and the 80th anniversary of these two milestone procedures that gave patients with cyanotic heart defects a chance for quite normal and long lives [4]. Blalock, Taussig, and Lillehei were never awarded the Nobel Prize despite being nominated multiple times [5].

Article information

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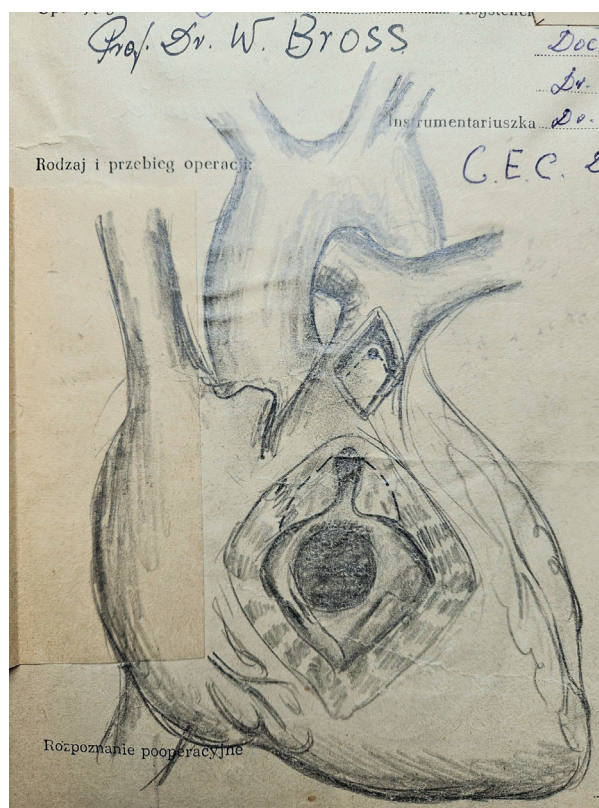


Figure 2. Drawing in the operating book: one of the first tetralogy of Fallot repair performed in Poland in 1964 (Magdalena Mazurak's own collection)

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