

**Dr Sanjay Gupta:** It must be some of the most devastating news, I think, parents can receive. Their baby has a heart defect. But today, with sophisticated imaging equipment, doctors can often find out about these problems months before the babies are even born, and that allows treatment to begin as soon as possible after birth. But now, medicine is beginning to take that next step: to see if we can fix babies' hearts before they're born.

Last Fall<sup>(1)</sup>, Jay and Sally Wiley were happily awaiting the arrival of their second child. Sally is an obstetrician herself. So on a quiet day in her office, she decided to have a sonogram.

**Sally:** They told us there was something seriously wrong.

**Gupta:** At 22 weeks of pregnancy, Sally's baby was developing a devastating heart defect called Hypoplastic Left Heart Syndrome (HLHS). A valve releasing<sup>(2)</sup> blood from the heart was narrow, too narrow. As a result, the left side of the heart was steadily shrinking<sup>(3)</sup> and shutting down. The baby was losing half his heart.

What were the options? What could you have done at that point?

**Jay:** Well, we had some hard decisions to make, whether or not we wanted to terminate the pregnancy, which we could have done, or just ride it out<sup>(4)</sup> and see what, see what developed.

**Gupta:** Their ride took them to the Brigham and Women's Hospital in Boston...

**Dr L. Wilkins-Hauq:** The valve is blocked.

**Gupta:** ... and Doctor Louise Wilkins-Hauq. This is the actual device that you used.

**Dr Wilkins-Hauq:** Right, so this is the styletic needle that we used.

**Gupta:** The plan seemed impossible: operate on the baby before he was born.

This was the scene in October when Sally and her baby underwent a fetal heart operation. Doctors placed a needle through Sally's abdomen, into the uterus, through the baby's skin, and directly into the heart of the baby. An amazing feat<sup>(5)</sup>, since at that point, the heart of a fetus is about the size of a grape<sup>(6)</sup>. These images of the baby's heart were taken during the actual procedure.

**Dr Wilkins-Hauq:** You can see that the tip of the needle is inside this black chamber, that's the left ventricle.

**Gupta:** That's amazing.

Once the needle reached the blocked valve, a tiny balloon was inflated, clearing the way for blood flow in the ventricle. And doctors could see that blood flow right away.

**Surgeon:** This is the goal, you want to see that red and blue across the valve.

**Gupta:** Earlier this month, Anders Wiley entered the world and both the ventricles in his heart are pumping away. Anders is in a Neonatal Intensive Care Unit, so doctors can monitor how his heart is working.

Can you see anything as where they performed the operation?

**Sally:** I think they probably went around the three ribs<sup>(7)</sup> here, but you can't see the scar<sup>(8)</sup> anymore, but they went through these ribs right into the heart.

**Gupta:** Anders does face a long road ahead. There is no guarantee that the valve in the left ventricle won't close again. But for now, he has a fighting chance at a normal life. He looks great to me, I didn't know what to expect, he looks really good.

And how Anders is gonna do in the long run is a tougher question. There've only been about a hundred of these fetal heart operations ever performed. And get this, the oldest survivor is just four years old, so it's brand new<sup>(9)</sup>.

**K. Couric:** And Sanjay, you're a neurosurgeon, but operating on that teeny, tiny<sup>(10)</sup> heart must require nerves of steel.

**Gupta:** You know, I was watching this actually going on, the ultrasound images are kind of fuzzy<sup>(11)</sup> as it is, and you're guiding this catheter through something so tiny. It was amazing. Typically magnifying<sup>(12)</sup> things several times to be able to see. The heart is this big and you're performing surgery on it.

**Couric:** Meanwhile, are they thinking about doing in utero surgery for other things, I know they do it for Spina Bifida for example, but anything else on the horizon?

**Gupta:** Yeah, I found something really interesting. They're looking at cleft lips and cleft palates<sup>(13)</sup>, a seemingly very disfiguring thing, even if it's repaired after birth. You saw there was no scar with Anders. If they could do that same sort of operation in utero, you might be able to fix these cleft palates and cleft lips without any evidence that it was even there.

**Couric:** But there are some risks, so I guess this is somehow controversial.

**Gupta:** It's a cosmetic procedure. Do you want to subject the baby to that kind of risk for a cosmetic procedure? People are still sorting that out<sup>(14)</sup>.

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### Lexical helpline:

1. **Fall:** Autumn
2. **release (v):** let something free
3. **shrink (v):** reduce in size
4. **ride out (v):** manage to deal with a difficult situation successfully
5. **a feat:** a notable act
6. **a grape:** a small edible green or purple berry that grows on a vine
7. **a rib:** any of the curved bones extending from the vertebrae and in some cases meeting the sternum, forming a cavity housing vital organs
8. **a scar:** a mark left on the skin after a wound has healed
9. **brand new:** completely new and unused
10. **teeny, tiny:** very, very small
11. **fuzzy:** not sharp enough to be seen properly, blurred
12. **magnify (v):** increase the apparent size of something
13. **cleft palate:** congenital fissure along the midline of the roof of the mouth, often associated with a cleft lip
14. **sort out (v):** resolve