Here's Bernardine! One-Woman Cabaret

Leisure Guide

Billy Martin Wants Burroughs

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For surgeons at Egleston hospital, it's hard to be detached from the children in your care, especially those times when all you've done hasn't been enough...

...'Then You Cry'

By Roger Witherspoon
Constitution Health And Science Writer

There comes a point in a 10-hour operation when you know you have lost.

No amount of heroic action, no amount of skill, no amount of prayer, no amount of silent pleading, exhorting, ordering or frenetically moving miniature needles and wires and tubes is going to change the outcome. The baby is going to die under your care and in your hands.

"Then you cry," said Dr. Willis Williams, chief of thoracic and cardiac surgery at Henrietta Egleston Hospital. "It is the rare case when a child dies that you don't cry.

"It would be inconsistent to be so intensely involved with the case and with the family, and put that much effort into saving a life, and not feel a loss when it goes wrong.

"Luckily, it doesn't happen very often. We haven't lost a child to heart disease since December. I'd go crazy if I had to face that problem every day."

Egleston is a children's hospital, affiliated with the Emory University School of Medicine. Egleston surgeons like Dr. Williams have other patients. They perform surgery on persons of all ages who have heart problems. But the bulk of Williams' patients are children.

The medical teams at Emory, operating out of both Egleston in DeKalb County and Grady Memorial Hospital in downtown Atlanta, perform about 400 coronary operations on children annually.

With adults who require coronary surgery, the problems fall into two general categories: those needing replacement of heart valves which have worn out or were scarred years ago by a childhood disease such as rheumatic fever, and those needing blocked arteries cleared out.

With children, said Williams, there are "about 1,000 different things" which can require the need for coronary surgery. Some of them are genetic disorders, and others are birth defects resulting from premature birth or myriad other

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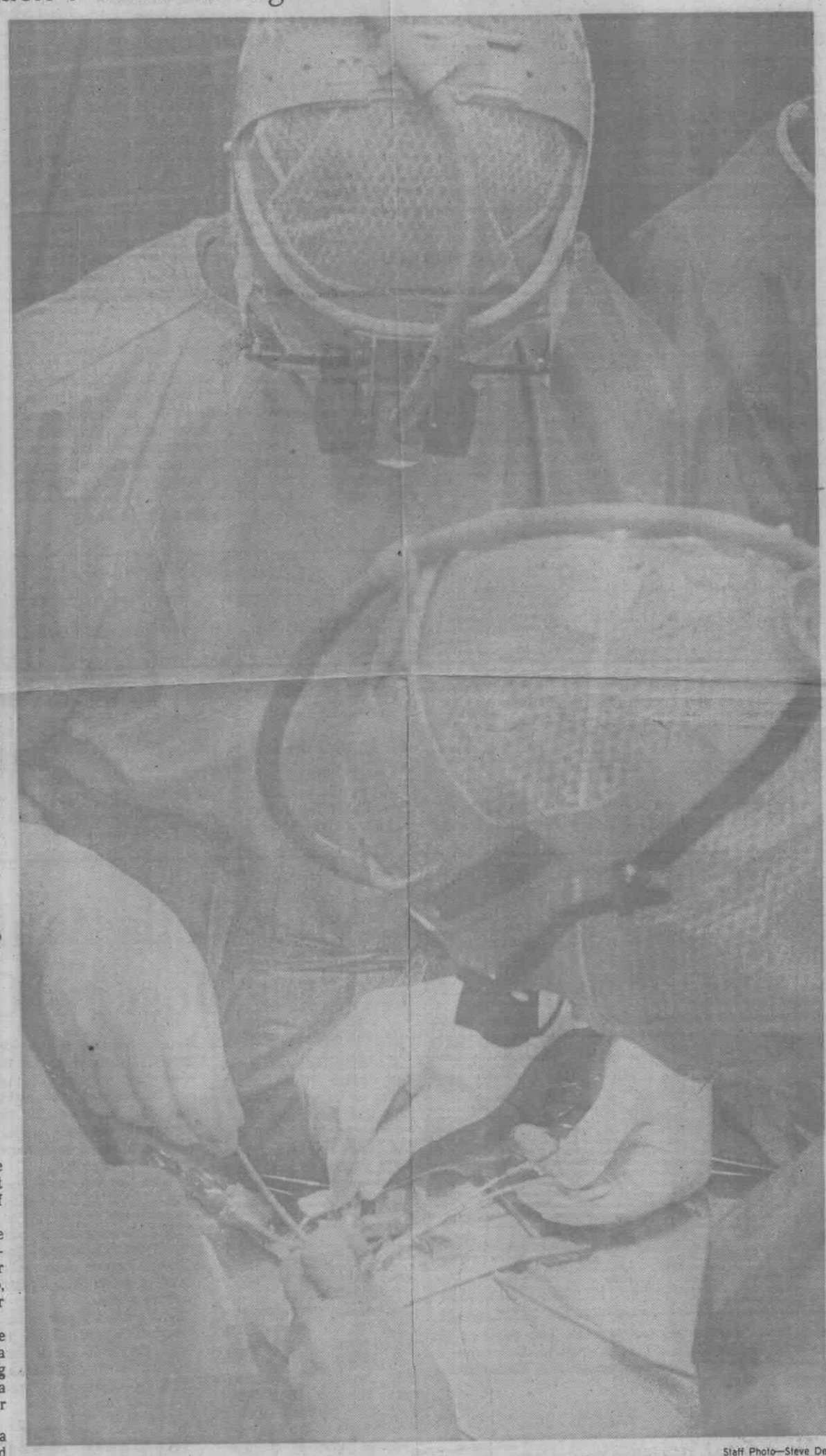

Staff Photo—Steve Deal

Dr. Willis Williams (back to camera) Is Assisted In Egleston Surgery By Dr. Lance Lester

The 7-Hour Battle To Repair Keisa's Misshaped Heart

By Roger Witherspoon
Constitution Health and Science Writer

Her name was Keisa and she was 18 months old.

A small, frail child, she weighed but 18 pounds — little more than twice her birth weight, and about half the weight for a normal child her age — and she was always short of breath.

It was Saturday, March 8, and she seemed to have caught another cold — but this time she had a high temperature and could not keep her food down. Her mother took her to the family's physician, Dr. A.D. Thornton in Greensboro, who thought Keisa had the flu — until he listened to her heart.

It was racing, topping 180 beats per minute though she was sitting perfectly still. And it was loud, audible without a stethoscope. And there was something else — a swishing sound, not unlike water swirling around and around in a washing machine. The analogy, in Keisa's case, was not far off.

It sounded to the physician like she had a hole in a chamber in her heart — the blood uselessly flowing around and around while the muscle beat itself to death trying to get some of it out into the body, where it belonged. Thornton did not know how long this condition had existed, but he knew, if his diagnosis was correct, the girl's heart could not continue racing that way for long.

Actually, Thornton was only partially right. Keisa had not one hole in her heart, but two.

* * *

The human heart begins as a tube, effortlessly funneling nutrients from one microscopic part of the fetus to another. As the fetus grows and the flow gets stronger, the tube buckles and folds back on itself, with each section imparting its own rhythm, its own nutrients to the flow. In time, tendons hold the folds together, arteries spring from the curves in the fold, and inner walls of the tube dissolve as the heart takes final shape.

When the process works, there are four chambers divided from each other by walls and valves: the right atrium, which receives dark, used blood from the body; the right ventricle, which takes blood from the right atrium and pumps it to the lungs; the left atrium, which receives cleansed, oxygenated, bright red blood from the lungs; and

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Surgery

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the left ventricle, which pulls blood from the left atrium and sends it through the body.

When the process works, the heart is developed during the first two trimesters of pregnancy and, from then on, one is seldom aware of more than a rhythmic, comforting beat under the breastbone.

But in the case of the child who would be named Keisa, the process failed.

* * *

Dr. Willis Williams, chief of thoracic and cardiac surgery at Henrietta Egleston Hospital for Children in Atlanta, was watching three television screens in the hospital's catheterization lab Tuesday morning, March 11. These were X-ray televisions, monitoring the progress of a thin, hollow catheter snaking its way from a vein in Keisa's right thigh up to her heart.

As the catheter curled into the heart, dye was released and outlined a series of problems. There was a large hole in the wall between the left and right ventricles, the lower chambers of the heart. Eighty percent of the cleansed blood, instead of flowing out the left ventricle, through the aorta and into the body, was pouring through the opening into the right ventricle and going back to the lungs. And these were being flooded.

But that wasn't all Williams saw. The pulmonary artery, carrying used blood to the lungs, was misshaped in the center and partially blocked where it connected to the right ventricle. Because of this bottleneck, and because of the hole between the right and left ventricles, a lake of blood was simply sloshing around and around in the girl's heart while her body was starved for blood and the nutrients it carried. Her heart was beating at twice the normal rate in an effort to force some of the sloshing blood to follow its proper course. It could not continue at that rate for long.

* * *

Keisa's mother spent Wednesday night at Egleston hospital, lying awake in a cot beside her daughter's bed. At 8:35 a.m. Thursday, Williams told her that Keisa's was a "high risk" case, and that many such children did not survive. But he would do his best. He ordered the child sent to the operating room.

As he left the mother he commented, "She's frightened. She wonders if she will ever see her child alive again."

During the next eight hours, he would have the same thought. Often.

* * *

Keisa's thin, 18-inch frame was lost on the six-foot long operating table, her head below a crossbar, as anesthesiologist Dr. James Bland fed a mixture of morphine and ketamine into her right wrist. When she was unconscious, other tubes were added to her wrists and ankles — avenues through which blood samples would be taken, pressure and temperatures monitored, internal fluids drained, and blood, antibiotics, anticoagulants and, in the end, coagulents could be added.

Some of the tubes would be monitored by Dick Rigatti, technician/operator of the heart-lung machine which cleanses the blood and circulates it throughout the body during the crucial part of the operation when the heart is shut down. To facilitate that, the blood would be chilled to about 60 degrees Fahrenheit, putting the child into a form of hibernation, and permitting Williams and assisting surgeon Dr. Lance Lester to keep the heart shut down longer than they could at normal bodily temperatures. Over the past 30 years, the development of the heart-lung machine has enabled surgeons to bring this kind of operation to more patients.

When the anesthesiology was done, Keisa was bathed with two antiseptic solutions, and covered with a clear plastic strip to keep all skin dirt or dust from blowing into the wound. Her body was then covered — except for her chest — by a series of blue sterile-paper operating sheets, the last of which was draped not over her head, but over the crossbar. For Bland and technician Terry Morris, the area under the crossbar would be their field of operations. They could reach the tubes in her wrists and take their measurements from their position at the head of the bed.

Adjacent to them was a screen which electronically monitored Keisa's heart beat, temperature and pulse.

Lester stood on the left side of the table. Williams, because he is right-handed, preferred the other. Both wore special glasses with built-in binoculars. Their work would be nearly microscopic.

Mary Jane Green, the scrub nurse, stood next to Lester. Trays filled with sterile instruments closed them in.

Rigatti wheeled his low-profile, six-foot-long silver heart-lung machine next to the table, about two feet behind Williams. The coils of tubing — one side clear coming from the foot of the bed; the other, at the head, containing bright red blood ready for the child — bracketed Williams.

* * *

It was 10:29 a.m. Williams accepted a scalpel from Green, closed his eyes in a brief, silent prayer, and cut a six-inch slit down the middle of Keisa's plastic covered chest.

The bleeding was small, but steady. Lester sopped the blood with gauze. Nurse Green lifted the spill with a suction tube, while Williams used an electric cauterizing gun to close the capillaries and small blood vessels severed by the incision.

Then, with an audible "plop," Williams punched his index finger under the breastbone and shoved the heart and lungs away. He held out his hand and Nurse Green handed him a silver, single-bladed electric saw with what resembled a sewing machine foot at the bottom. The blade disappeared a half inch inside Keisa's chest, and the top line on the monitoring screen beside Dr. Bland jumped four inches as the blade began cutting through the quarter-inch-thick breastbone up to the child's neck. The handle of a rectangular metal clamp, which works like a wrench, was twisted until there was a six-inch square illuminated by the overhead lighting, bordered by the dripping breastbone and filled with Keisa's still racing, erratically pumping heart. It was 10:35 a.m.

Williams held out his hand and the saw was replaced by a pair of scissors, which he used to cut out the top of the pericardium, a membrane forming a sac around the heart. He gave it to the nurse to save for use later in the operation. The edges of the rest of the sac were threaded, pulled back, and the thread tied to the chest clamp. The result was a crude bucket, about four inches square, containing the heart with the pink lungs pulsating over the edges with each breath. This would be the work area.

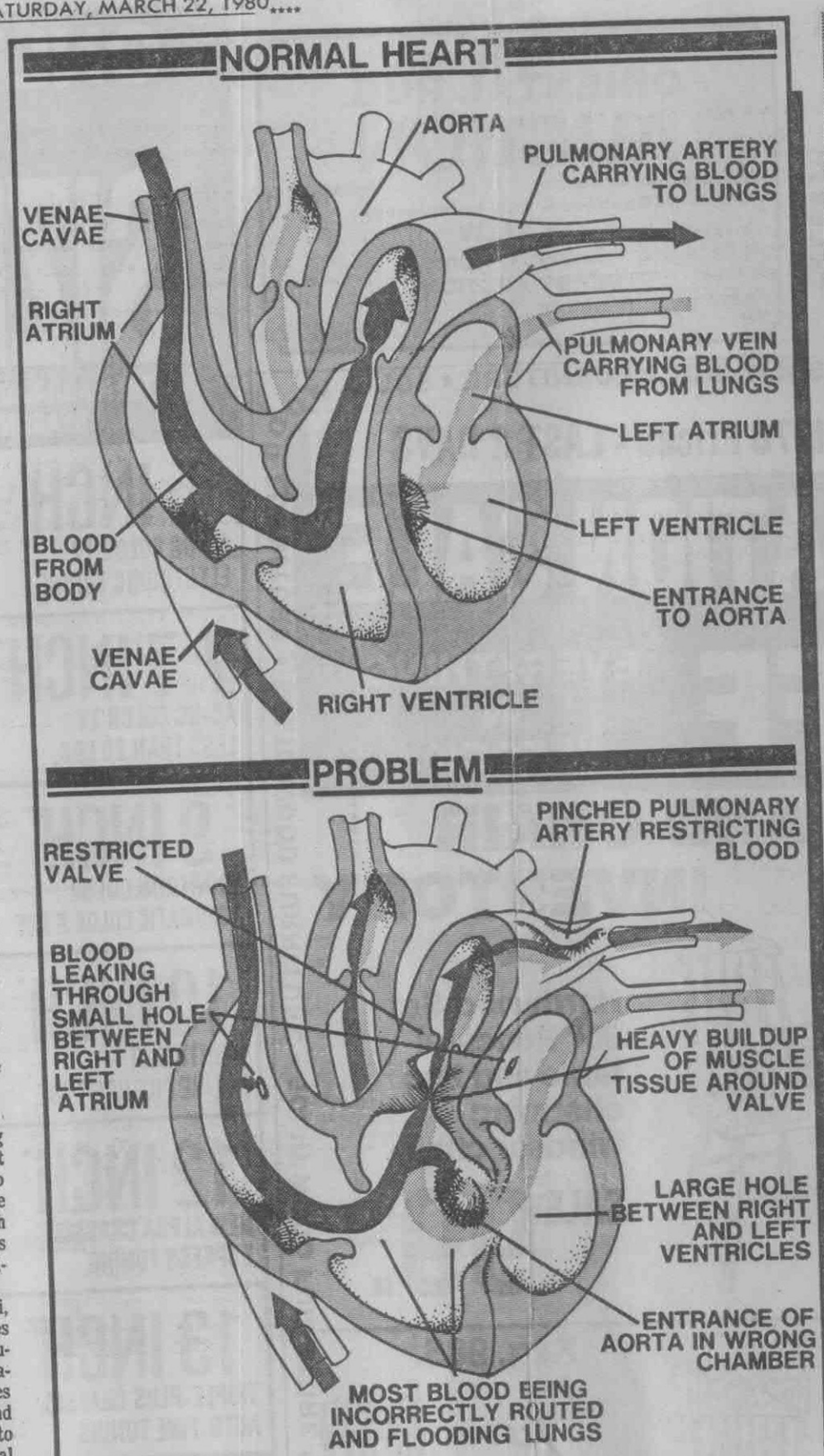
At 10:44 a.m., Bland added heparin, an anti-coagulant, to the bloodstream to prevent clots from forming in the heart while the surgeons worked. Williams tied a tourniquet around the vein bringing blood from the upper portion of the body into the right atrium, cut a half-inch slit in the vein, and inserted a tube which would take the used blood to Rigatti's heart-lung machine a few feet away. He sewed around the edges of the slit to keep the blood from spilling out, though each minute needle puncture sent its own small spurts of blood into the rapidly filling cavity. Green siphoned. Lester dabbed with gauze and cauterized.

Bland said the heparin level was fine, and Williams sliced into the aorta, the major artery taking blood into the body, and inserted a second bypass. Again the working area filled before he stitched the edges of the wound and cut off the flow. A third incision was made at 10:55 a.m. into the vein bringing blood from the lower part of the body. With the insertion of a bypass tube here, the first phase of the operation would be completed — blood from the body would bypass the heart and flow to the heart-lung machine and, after cleansing, would be pumped back into the aorta and into the body.

But then trouble. "We've a disaster" said Williams to Rigatti, "give the blood back."

The pressure buildup had burst the stitching in the vein going to the right atrium and dark, used blood flooded the working-area "bucket," spilled over the lungs and flowed into the chest cavity. The blood pressure levels on Bland's monitor dropped sharply. The heart-lung machine had not yet been turned on; the cycle was not complete; the body was not getting blood to replenish what it was losing. But Rigatti quickly sent fresh blood coursing though the tube in Keisa's aorta and into her body. Before the operation ended, he would pump nearly two liters of blood — twice what she started with — through her system.

The leak was sealed at 10:59 a.m. and the cleanup continued. Rigatti's machine was turned off and the heart continued receiving and pumping blood on its own. For the next 12 minutes, the team continued applying tourniquets, sopping blood, checking blood pressure levels and conditions and attempting to close leaks.



The diagrams by staff artist Trevor Irvin (at left) show the structure of a healthy heart (top), the problems with Keisa's heart (middle), and the corrections made by Drs. Lance Lester and Willis Williams. In the photo below, the surgical team prepares to go to work. In the foreground, technician Dick Rigatti monitors the heart-lung machine which enables the physcians to stop the heart so they can perform the repairs.

Above, operating room nurse Mary Jane Green helps Dr. Willis Williams into the sterile paper surgical gown he wears during operations at Egleston Hospital. At left, Williams, the hospital's chief thoracic and cardiac surgeon, pauses a moment before entering the operating room. He is holding a pair of special surgical magnifying glasses which are needed because his job is nearly microscopic. (Staff Photos—Steve Deal)

Then Keisa's heart stopped beating. The white lineon Bland's monitor went flat, as the taxed heart merely quivered in fibrillation like a jellyfish on its own electrical energy.

The only sounds were those of the Muzak in the background. All in attendance could read the line on the scren, and all knew what to do. Rigatti started the machine — taking out the old blood and pumping in fresh — and began coong the blood to about 60 degrees Fahrenheit, putting the chil in the state similar to hibernation, slowing her processes dn. Bland shut down Keisa's lungs and added chemicals to op the quivering. Williams cut into the wall of the left ventrle and inserted a siphon to make sure the organ did not fill th seeping blood and stretch. They had planned to shut the hrt down gradually but, "she's gotten ahead of us," said Willias, "and we will probably have to give her shock to get it gog again." And that might not work, either.

It was 11:15 a.m. and the heart was stopped.

Williams sliced into the right ventricle and he and Leer sewed the sides back and out of the way. There was a car view through to the left ventricle — the hole was larger en they had imagined.

And then there were complications not visible on Tsday's X-ray. Both the aorta, taking blood to the body, andhe pulmonary artery, taking used blood to the lungs were comg out of the right ventricle. In essence, the lower two chamlrs of Keisa's heart were one. Constructing a partition was possible — but there was no guarantee that chambers which had never acted independently of each other could learn to do so after the operation was complete.

And then there were more complications. Muscle tissue had built up around the opening to the pulmonary artery; the valve controlling the flow into the artery was improperly formed and only partially opened, and the artery itself was inexplicably "pinched" to half the proper size as it exited the heart.

First the easy part. Williams trimmed the muscle overgrowth nearly back to the heart wall — hoping he did not damage the unseen electrical circuitry which makes the heart beat regularly. If he did, the child would need a pacemaker; and there would be no way to know until they tried restarting her heart.

Williams and Lester decided to construct a wall between the two outlets, and were handed a Dacron patch by Nurse Green. They never asked her for a size. In fact, they did not speak to her throughout the operation. They did not need to. She anticipated everything and, when the patch was in, it did not have to be trimmed.

The thread used in heart surgery has quarter-inch, curved needles at each end and a small gauze patch in the middle — the patch covering the puncture holes made by the needles and easing the strain the thread would put on the tender heart tissues.

It was 11:48 a.m. Eighteen sets of stitches were in, and the two physicians began tying a series of square knots to them. In 11 minutes, they were done. Keisa had taken a liter of blood from Rigatti's $28,000 machine.

Reshaping the valve took less than a minute and they began reshaping the pulmonary artery. Williams made a one-inch incision at the narrow portion of the artery. Nurse Green handed him the pericardium tissue saved from the beginning of the operation, and the surgeon began stitching a new, wider wall to the malformed artery.

It was 12:19 p.m. Green provided another patch and they begin sewing the right ventricle shut. The heart cannot survive much longer than an hour without blood in it, even if it is not beating. The siphon kept the blood level low, but the area was still half immersed.

It was 12:35 p.m. A thin tube was inserted through a slit in the left ventricle wall. The tube will be pulled out through Keisa's side and be used later to insert stimulants directly to the heart, if needed. Dacron patches were sewn around it which, when the tube is pulled out days later, will automatically plug the hole.

It was 12:40 p.m. Williams cut into the right atrium and, as he suspected, there was a small hole between it and the left atrium which was allowing used blood from the body to comingle with purified blood from Keisa's lungs. He quickly stitched it shut. The operation is done, but will it work?

* * *

It was 12:47 p.m. Bland added calcium, a heart strengthener, to the child's bloodstream and they waited. Keisa's heart began to beat.

Rigatti's heart-lung machine was still doing 70 percent of the work, but the heart was pumping and blood was flowing through it. Gradually, Rigatti would ease up on the amount of work done by the machine, and let the heart take over — if it could.

At 12:54 p.m., the patch closing the right ventricle began to leak.

Williams added more stitches and Dacron stoppers. Lester sopped with gauze and Green siphoned, provided supplies to both men, and got rid of waste material.

At 1:04 p.m., Rigatti cut off the heart-lung machine. The last bypass tube was extracted, and Bland began adding a coagulant to Keisa's system.

During the next two hours, Williams took a break while Lester — a veteran surgeon who will, eventually, be the chief cardiac surgeon on other cases — spent time closing leaks which sprung in virtually all the incisions, removing the tubes to the heart-lung machine, and sewing up the arteries. At several points, Bland had to shut off the lungs — for no more than 30 seconds — so he could sew in areas normally covered by that pulsing organ.

The final stages involved sewing three thin wires — to be connected to an external pacemaker — to the three affected chambers of Keisa's heart: her right atrium, and the right and left ventricles. Quarter-inch suction tubes were poked through her abdomen wall and left in either side of her chest cavity to siphon off blood which would continue to leak for a few days.

She was sewed up in four stages. Six thick wire sutures were used to close the breastbone, then successively thinner thread was used to sew the layer of sinuous tissues, and the lower layer of skin. Lastly, Lester used a horizontal stitch, just under the top layer of skin, to hold that portion closed. When completed, there were no "railroad tracks" on the surface of the child's skin showing where the operation was, just a thin red line which would nearly disappear as she grew up.

* * *

It was 3:02 p.m. All the participants in the room were watching the monitors and exchanging quips in an effort to relieve tension while Bland and his assistant, Morris, disconnected their tubing and nurses removed the various layers of covering and prepared the inert child to be moved to the intensive care unit.

Her right arm moved suddenly. All motion in the room ceased. Keisa opened her eyes.

It was 3:37 p.m., and Williams, on his feet since 5 a.m., was exhausted. He was draped across a chair in the small lounge for the surgical staff just outside the operating room, waiting for word that the child is at the elevator and about to be moved to the second floor intensive care unit.

At 3:42 p.m., he put the traditional white smock over the operating room greens and headed for the doors to the lobby. On the other side, Keisa's mother, red-eyed from lack of sleep, had squeezed a box of Kleenex into a formless mass. Her husband was silent, lest he break the concentration which has enabled him to avoid tears since he last saw his daughter alive.

Williams pauses on his side of the door, straightens his uniform, smiles away the fatigue, and jauntily walked into the lobby.

"You can cry now, ma'm. Keisa lives."

Postscript

Egleston Hospital reported Friday that Keisa is resting comfortably, although she is still listed in serious condition in the facility's intensive care unit.

Cry

Continued From Page 1-A

causes. In many cases, the genesis of the defect is unknown and treatment is of an emergency — and exploratory — nature.

In this day and age, most heart patients survive surgery. But, Williams said, "we expect 98 percent of the adults to survive surgery, and about 90 percent of the children to survive."

The difference depends upon the disorder. In many cases, there is a mortality rate approaching zero. For other ailments, the chance of survival is poor. In those cases, he said, "we take some heroic steps with newborns, and it may be that we should not operate in some of these cases because those children are going to die anyway. But we don't have enough knowledge to determine that yet.

"Perhaps with more experience, we may decide at some point that children with some disorders cannot be helped, and we will not operate at all because it would be pointless to do so. But for now, we do our best for all of them."

A surgeon could improve his odds. He could obtain a 100 percent survival rate — if that were the goal — by selecting to operate and treat only those patients who had optimal chances for survival, and ignoring the rest.

"But there is nothing humanitarian about percentages or score cards," said Williams. "And I am still confronted with the problem that 10 percent of my patients die.

"There is a great deal of sadness and loss in a child's death, more so than with an elderly person who has already lived a life and done what he or she was intended to do.

"You never have the feeling with a child that he or she has lived a full life and it may now be just as well that it is over."

About half the children who need coronary surgery require it during their first month of life. To some extent, the progress that modern medicine has made in many areas, including fertility and childbirth in general, has contributed to the problems of the pediatric coronary surgeon.

Until about two years ago, for example, there was a class of infants with a problem bearing the imposing nomenclature of Patent Ductus Arteriosus, which was invariably fatal. The problem afflicts about 12 percent of all premature babies. It didn't much bother those weighing in at one to three pounds until recently, because babies that small didn't survive delivery. Advances in medical science have since raised the survival rate, however, and thus have increased the incidence of PDA.

The ailment involves a tube (the ductus) connecting the pulmonary artery — which after birth transmits used blood from the heart to the lungs for cleansing and oxygenation — to the aorta, which transmits fresh blood to the body. Because a developing baby's lungs do not work during the fetal stages, there is no need for blood to be funneled through them, so the ductus serves as a lung bypass. At birth, the ductus closes automatically, and blood flows from the pulmonary artery into the lungs, as intended.

But in premature infants, the muscles in the wall of the ductus are not as developed as they need to be, and they sometimes — in about one in eight cases — fail to squeeze the tube shut. The blood continues avoiding the lungs and flowing, without being cleaned, into the body.

Most such children, said Williams, are too weak to operate on, particularly since most anesthetics enter the bloodstream through the lungs. For the past year, Egleston and 12 other medical centers around the nation have been participating in a National Institutes of Health study of the drug Endocyn, which is similar to aspirin and in many cases has triggered the ductus to close despite the weak muscular structure.

But it is more than just an experiment at Egleston.

"Every child's death raises a question for me," said Williams. "The first is why, and then I wonder what we can do to prevent another child from dying. I take every death personally. I know there must be a reason for it, and if that is an unsolved problem, then it is something we have to work on.

"Each and every problem, to me, has a child's name on it. A child I knew. A child who died in my care. I don't just dream up research ideas in the abstract. I owe those children a solution."

As Egleston's chief chaplain, Rev. Robert Vandiver, said, "The children who die here have been patients who were treaed for weeks, months, and sometimes for years. You are talkng about relationships where the doctor, nurses and staff know not only the child, but the family, and there is a much closer relationship than you might ordinarily expect out of a hospital setting.

"Sometimes there is the notion that 'I somehow failed,' or 'It i my fault,' or 'I should have been able to outdo death.' It is apersonal loss more than just a professional one. The patien has taken on some of the quality of a family member, paricularly if the relationship has gone on for a long time."

The situation is the same for nurses, said Vandiver, "except sometimes the relationship is much more intense. The nurses are in 24-hour contact with the patient and the family and, after two or three years, some find themselves emotionally overextended and leave."

Vandiver runs monthly counseling sessions for members of the nursing staff who feel they need support in order to continue with their patient load.

Sometimes they can rationalize a death. The disease was too far gone. There are too many things modern man just does not know. Or there was a purpose for the brief life and subsequent death.

"I have seen children who lived two years and had a bigger influence on the lives and habits of all they came into contact with than have people who lived to be 70," recalled Dr. Williams. "I don't know the role each child was intended to play. I just try to be an instrument of the process."

But sometimes he is not. Sometimes, in the midst of reflection, when the rationalizations are concluded, Williams has to admit that he made a mistake, that his role in the process contributed to the death of a child he cared for.

"I have my religion," he said quietly, "and I know I tried. I know I have healed and I know I have alleviated suffering and I know I am not perfect. I cry. I get over it, and I try again. I am still a doctor."