MUSC's First Organ Transplant
Oral History Project

Interview with Dr. H. Biemann Othersen, Jr.

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Interviewers: E. Brooke Fox, MUSC University Archives
&
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Location: Basic Sciences Building, Room 107

Brooke Fox: Can you tell me about your background and schooling?

Biemann Othersen: I'm a Charleston boy. I grew up in Charleston, born here in 1930, Charleston , went to local schools, went to Mitchell School, then went to Craft School, which is now Craft's Condominium, and then to Nathan Junior High School, which was a home on Wentworth Street and was right by Memminger School. It was a junior high school. And then from there went to the High School of Charleston, which is now part of the Medical University as the School of Health Related Professions. And they've been able to maintain the exterior of the school, and it looks just like it did when I went there.

Then I went to the College of Charleston and graduated from the College of Charleston in 1950 and graduated from Medical College here in Charleston in 1953.

Fox: What got you interested in medicine?

Othersen: It's an interesting story. In 1946, I graduated from the High School of Charleston, and I had a classical degree- took four years of Latin. But I was planning to go to college and I was planning to be an electrical engineer. At that time, in 1946, all the veterans were coming home from the war after Germany had capitulated, and all schools were giving first preference to veterans. I had been accepted at Clemson to study electrical engineering; in fact, I had tried out for and gotten a small scholarship there. But they wrote and said that they had too many veterans coming back; they had to defer some of the non-veteran admissions. So, they said, we would like to defer you for one year, and then you can come back the following year.

So, I had to find someplace to go for a year. I went to the College of Charleston. The College of Charleston at that time was a very small school with a total enrollment study body of 300 students, and I went there still planning to go to Clemson the following year. But they had no engineering courses, so I took premed, and I liked it so much that I stayed at the College of Charleston and took three years there. At that time, they had a degree called Bachelor of Science with Medicine, BSM. So, if you spent three years at the College of Charleston and then got accepted to medical school, after your freshman year of medical school, if you survived that, then you were given the degree at the College of Charleston. I was in a class which we called the last class of the greatest generation. Jim Edwards and Arthur Ravenel were in that class too.

Fox: How did you get interested in your specialty of pediatric surgery?

Othersen: Well, I went to medical school here; when I graduated in 1953, since I'd had all of my schooling in Charleston, I wanted to go somewhere where I'd be exposed to the rest of the country, and so I took my internship at Philadelphia General Hospital, which was a large city hospital, 1,100 beds which had a 109 interns, rotating internships. It was like a big college campus, and we got to know people from all over the country.

And at that time, I was very pleased to note that our education here at the Medical University -- at that time it was the Medical College -- prepared us for competition with anybody from anywhere. We were just as well-trained as the other hundred and something interns. I spent a year there, then I had to go into the service and spent two years in the Navy. After I got out of the Navy, I got out in September, and residencies didn't start until July, so I took a post-graduate course at the University of Pennsylvania. At that time they had a course in surgery at the graduate school of the University of Pennsylvania. Then I took five years of

surgical residency with general and thoracic surgery at the Medical College of South Carolina.

During that time, I really enjoyed taking care of children, and there were a number of people from here who had said they were going into pediatric surgery but never did, and I decided I was going to go into pediatric surgery. I read a little book called *The Surgeon and the Child* by Willis Potts, and that really made me cement my commitment to go into pediatric surgery, because he just sort of expressed the heart of pediatric surgery. So, then after my residency here, I went to Columbus, Ohio, for pediatric surgery.

Fox: When did you join MUSC as part of the faculty?

Othersen: I always thought I would come back to Charleston. Like old soldiers never die, old Charlestonians always come back. So, I always thought I would come back to Charleston, and I wanted to give it a try. There were no pediatric surgeons in South Carolina and none in Charleston. I had talked to all of the surgeons in Charleston, asking them whether they thought it would be a good idea to come back. Not one of them told me to come back. They all said, "We don't see enough children to really limit our practice just to children," so they said, " you wouldn't have enough to do."

So, I talked to the Medical School, because I was interested in teaching and being on the faculty. And at that time, the chairman of the Department of Surgery thought it would be a good idea to get a year of research, so when I finished Ohio in 1964, I then spent a year at Massachusetts General Hospital as a research fellow. At that time, I did research that made me interested in immunology and transplantation. I then came back to the Medical University in 1965.

Fox: What was your first position at MUSC?

Othersen: I was assistant professor of surgery, (pediatric surgery), , and later had an appointment as assistant professor of surgery and pediatrics. At that time, we had what we called geographic full-time; my starting salary was 11,000 dollars a year, and I was expected to make anything else above that from private practice. It was kind of slow at first; in fact, I remember my first patient. My first check from private practice was 2 dollars. In fact, the patient was a relative of mine who wanted her ears pierced, and I pierced her ears and I charged 2 dollars for it. I wanted to frame that check because I thought that would be a good memento, but I needed the 2 dollars, so I cashed it.

P.R. Rajagopalan: Can you tell us about being one of the first full-time staff at MUSC?

Othersen: You're absolutely right. Dr. [Frederick Evart] Kredel, chairman of the department, was the first full-time surgeon. Up until that time, the chief of surgery was always part-time and worked in practice in the community. But Dr. Kredel became the full-time professor of surgery, and then he had three other people that worked with him. Dr. Hank Mayo was an assistant professor of surgery, and Dr. John Hawk was running the Cancer Clinic with Dr. Bob Haggerty. And so those were sort of the three old-timers that started off the full-time faculty.

And then there was a younger group that came in, and I was one of those that came in as a full-time faculty member. As we recall, geographic full-time; our whole time was spent at the Medical University, but we were paid a salary that was not really remuneration for full-time, but then we did a private practice . It was a time of rebuilding, and when Dr. [Curtis P.] Artz came in, that's when he brought Dr. [C. Thomas] Fitts.

Rajagopalan: After you came back from Boston and joined the faculty, did you start work in your immunology lab at that time?

Othersen: Since I was the only pediatric surgeon in South Carolina, I felt I had to draw on the entire state. And so a lot of my time was spent going around the state telling people what pediatric surgeons did, because at a party , a pediatrician told my wife Janelle that he would never refer a patient to me. And she said, "Why?" and he said, "Well, since he also does pediatrics, he wouldn't send them back; he'd just take care of the patient." So, I had to explain to people that a pediatric surgeon was a surgeon who just operated on children, but didn't practice pediatrics also.

So, that was a primary goal, but I also had a lab that we did some transplantation-type research. In fact, Dr. [Johb Arthur Siegling??], who was the chairman of the Department of Orthopedics -- -- said he knew an orthopedic surgeon in Japan who had a young fellow who wanted to spend some time in the United States. And he said he would be willing to come over. So I got in touch with him and I got a grant -- it was from the Department of the Navy -- and I had enough money in that grant to pay this fellow, Dr. [Susumu??] Tamai, to come over and spend a year and a half with me. He was a micro surgeon, and he's gone on to a career in microsurgery; replantation of digits and so on. He did kidney transplants in rats for us as part of my research in rejection of transplants.

Fox: Who was involved in making the decision for the first operation at MUSC?

Othersen: Well, you might ask what's a pediatric surgeon doing being involved in transplantation on an adult, since the first patient was an adult; he was 24 years old. When I went to the year of research in Boston, I particularly

wanted to learn something about immunology because there are some diseases in children, particularly a tumor called neuroblastoma, that is very immunologically sensitive. And some children develop a neuroblastoma and then it spontaneously disappears, and it's thought that that may be immunologic rejection of that tumor.

So, I thought that I would be able to learn the magic bullet that would be the solution to tumors like neuroblastoma, and that was the reason that I went to the transplant lab. And in the transplant lab, I wanted to learn basic immunology. I didn't want to be a transplant surgeon, but at that time, the people who knew the most about transplantation were the surgeons, because they were preparing for kidney transplants. Boston was a good place for that; in fact, Dr. Joseph Murray, who did the first successful kidney transplant in the United States, was down at Peter Bent Brigham Hospital, He got the Nobel Prize eventually for his transplantation research and pioneering clinical kidney transplants.

I was able then to go to watch their clinical transplantation at the Brigham Hospital. I also did kidney transplants in dogs. And at that time, the emphasis at Massachusetts General was on the depletion of lymphocytes through anti-lymphocyte serum, so I used anti-lymphocyte serum in the dogs to do kidney transplants on them.

So, I had experience in transplantation, although that was not my primary interest; my primary interest was the immunology of rejection. I had experience in lymphocyte depletion through a different mechanism, not through the mechanism of draining the lymphocytes, but through anti-lymphocyte serum that was raised in horses. So, that's how I got to be part of the team, and Dr. Artz, who was the chairman of the department at that time, had Dr. Fitts who had been with him at the University of Mississippi and came to the Medical College of South Carolina. He got

him to be the head of the team, and they worked with a nephrologist and of course with the urologist, and they asked me to be part of it simply because of the fact that I had some experience.and had watched the clinical procedures, and it had never been done here before.

Rajagopalan: What kind of problems or hurdles had to be overcome before the first transplant was reached?

Othersen: The first thing you had to do was to develop the milieu or the attitude that we were prepared to do something like this and we weren't experimenting on people; that a lot of clinical research had been done; all of the procedures for maintaining the patient had been done in animals; that you knew what you were doing; and that this was a feasible procedure to go ahead with. Subsequently we've seen all the controversy about heart transplants and artificial hearts and how that raised an ethical dilemma, but at this time when we were considering a kidney transplant, enough people had worked on it that we had a nephrologist who was good at maintaining the patient with dialysis and we had a good hemodialysis program. Subsequently peritoneal dialysis was used, but you can't use that in patients who are having a kidney transplant, because you're going to be operating on the peritoneal cavity.

So, we had a good hemodialysis program, and Dr. Arthur Williams was good at that, so he felt that he could maintain the patient without kidneys while the surgical procedure to remove the kidney was an operation that urologists did all the time; and then reimplanting the kidney into the bladder and into the new patient had been done in animals. So, that hurdle had to be overcome first so that people said, yes, this is a feasible thing, and you're not just going out on a limb and experimenting on this one patient. But then all of the laboratory work was a foundation for that.

Rajagopalan: What about the institutional support for the endeavor? Did you encounter any problems? What was the environment like from the institution in taking that big step?

Othersen: That was a big step, and it was something that you wouldn't do, just go into the operating room and say, I'm going to do a kidney transplant. You had to be sure that you had amassed the right resources in the way of people, and at that time, team concept was very prevalent, and we had to get a team of people who were going to be able to do this. So, that team would consist of the internist and nephrologist, the surgeons, the urologist, and the operating room nurses. The operating room had to be prepared for that; the nurses had to know what instruments were needed, and administration had to be convinced that this was the way to go.

As far as I can recall, there wasn't any real opposition -- nobody threw any big obstacles in the path, and everyone was very supportive once it was judged that this was a doable thing.

Rajagopalan: Do you think the environment there was different in terms of the way the institution reacted to the concept of doing something new and different?

Othersen: I think it's a lot easier to do things, and now, instead of having to convince administration it's the thing to do, administration sometimes wants to do new and different things in order to increase their competitive edge. But that was not the case back in 1968 when the transplant was done; at that time, everybody was very conservative about anything, even the publicity was very conservative and people tried to keep a low profile.

Fox Do you recall specifically who the OR nurses were?

Othersen: I don't recall specifically who the OR nurses were at that time.

Fox: Was it a large team?

Othersen: It was part of a team. I'm sure that there were at least four or five different nurses on that, because not only did you have to have the team of people to put the kidney in, but you had to have a team of people to take the kidney out. And then the intermediary stage would be to take that kidney, prepare the kidney, and then take it in to the place where the kidney transplant was done, because they're done in two different operating rooms.

Fox: So, who removed the kidney from the donor, Thelma Jean Madden?

Othersen: That was Dr. Fletcher Derrick's job. Fletcher Derrick was the urologist. He was assistant professor urology at the time. I'm not sure whether he was full-time with the school or part-time. There was a time when he was full-time, and then he went out into private practice -- or he went to Washington and then came back, he had a private practice. But he did the kidney removal from the donor. And that had to be done very carefully, of course, because here you have a patient who doesn't have anything wrong with her, and you want to be very sure that you create no harm; first of all, do no harm. So, you have to take out that kidney without endangering that patient who's donating the kidney, and that was his job.

Fox: Who removed William Ashley's diseased kidneys? How far in advance were they removed?

Othersen: I don't know that. That would've been done by urologists also. The urologists were the ones that usually removed the kidneys, operated on kidneys.

Fox: Who put the new kidney in?

Othersen: Then the new kidney is put in -- there are three things you have to do when you put a kidney in. One, you have to hook up the arteries, and then you have to hook up the veins, and then you have to hook up the ureter, which drains the urine from the kidney into the bladder. The arteries and veins are usually joined by a general or vascular surgeon. . Then the urologist is the one doing the implantation, putting the ureter into the bladder, because they do that ordinarily in other operations. If there's reflux (when urine goes backwards into the ureter), a similar operation is done. The ureter is designed so that the urine flows from the kidney down into the bladder, but it doesn't go back up. There's a sort of check valve there. But if that check valve isn't working, then they do a procedure to create artificially a valve. Urologist are accustomed to doing that procedure on other patients, not just transplants.

So, in a kidney transplantation, there's nothing that surgeons don't do often and that urologists don't do often; you just have to put it together into doing your kidney transplant. In other words, hooking vessels together is nothing new to surgeons, and hooking the ureter to the bladder is nothing new to urologists.

Rajagopalan: Is there anything special you recall about setting up for the first transplant?

Othersen: As far as I remember, I can't recall any big problems, like nobody dropped the kidney or anything such as that. There are no special instruments that you need; the instruments are the ordinary instruments that you would use otherwise. The only thing different is that when the urologists take out a kidney for disease, they take it out and send it to pathology for examination. But in this case, when Dr. Derrick took out

the kidney, it had to be preserved and had to be made ready to implant into another patient. That's the difference in the procedure and handling of the kidney.

And that was where my job came in. I was to take the kidney from the donor area when Dr. Derrick had taken it out, and then we put it on a back table and flush it out to get all of the blood out of the kidney and to cool it down some so that the cells would not die quickly. When the body's at normal temperature, the cells die fairly rapidly, but if you cool them down, everything slows down, metabolism slows down, and the cells last longer. So, we had to flush out the kidney and cool it down, and then take it to the room where the patient was to have it implanted.

Rajagopalan: How did the process of selection of the donor for this particular recipient come about? Do you recall anything about that?

Othersen: At that time, there was quite a bit of research done on matching patients up with each other, and for that reason, cadaver transplants, taking the kidney out of a patient who died and implanting it, was not very successful because it was difficult to get them matched up with the antigens and the genetic match. But the idea was to take people who were closely matched. Of course, the first successful kidney transplant by Dr. Joseph Murray was in a patient who was an identical twin. Organs can be exchanged between identical twins because there's no rejection process. It is strictly a mechanical process of removing s kidney from one twin and putting it into the other twin. The body doesn't recognize a foreign object, because it isn't foreign if they're identical twins.

In our case, it was attempted to try to find someone as close to this patient genetically as possible, and a sibling is always a good choice, because they are liable to have the same or similar genes. And I don't

recall whether there was any controversy about who was better matched; I just think his sister turned out to be the best match.

Rajagopalan: Do you recall if there were any entities that decided who got what kind of treatment, so-called "God committees?"

Othersen: That process was mainly handled by the nephrologist, by Arthur Williams and his group, and I don't recall that there was any controversy about whether he was a good recipient.

Rajagopalan: Not necessarily the controversy, the process of selection. In other words, the resources in those days were fairly limited in terms of who got what.

Othersen: You didn't want to do anything that was going to consume a lot of resources; you didn't want to do anything that would waste a kidney from a normal person and put that person at risk of going through life with one kidney although there are a lot of people who go through life with one kidney. They're born with one kidney. But you still didn't want to put a patient at unnecessary risk and then find the kidney didn't work and it would be rejected quickly. So, yes, there was a committee that did all of that, but I wasn't involved in that. The only reason I was asked to be part of this committee was because I had experience with the transplant procedure.

Rajagopalan: Did you have any involvement in lymph depletion that Dr. Artz and Fitts were interested in pursuing at the time?

Othersen: I remember very vividly, since I was trying to work in the lab and had my own lab going with doing the kidney transplants in rats -- and the reason we wanted to do kidney transplants in rats; dogs were very expensive; rats were a lot cheaper. A good dog cost us 80 to 100 dollars, and at that time

that was a lot of money, and you could get a rat for 3 dollars. So, we wanted to do the kidney transplants in rats. Plus we had contact with Jackson laboratory in Maine which could furnish us with genetically defined rats, and you knew which rats had which genes.

So, that was the reason for getting this surgeon from Japan to do the kidney transplants in rats, because dogs were mostly just mixed breed and so you never knew what they genetically had; what their makeup was. But there were two ways of preparing patients. At that time, we didn't have all the sophisticated drugs, like cyclosporine, that reduces the reaction or rejection process. We were focusing on using something to deplete the lymphocytes, because in the blood it's the lymphocytes that attack what the body recognizes as being foreign, and that's what attacks them and kills them. These are so-called killer lymphocytes.

And there are two approaches, and Dr. Artz and Dr. Fitts approached it by draining off the lymphocytes. There's a lymphatic duct in the body that drains a lot of the lymphocytes from the gut, and then up through the chest, drains it up into the big vein here in the neck, the left side of the neck. And their approach was to put a cannula into that duct; to put a little needle, a plastic tube, into that duct and drain off all those lymphocytes, and by draining them to deplete them. Then there wouldn't be as many lymphocytes around to attack the transplanted kidney.

In Boston, we were using anti-lymphocyte serum. You would take the lymphocytes from the patient -- in my case, my patients were dogs, and I would take the lymphocytes from them, put them into a horse, and the horse would then develop antibodies against those dog lymphocytes. And then you would take the blood from the horse and make a serum out of it, and then you'd give it back to the dogs and it would suppress, knock off their lymphocytes.

So, there were two different methods of depleting lymphocytes, because we didn't have the drugs that are available now to do it. And so Dr. Fitts was doing lymphatic drainage in animals, and he was using goats and cows. You know, you don't miss a cow in the lab over there. And the reason cows were used is that the lymphatic duct is a small, very fragile thing, and until you get accustomed to working with it, you want it as big and as tough as possible, and cows had a little better structure to work with.

Fox: When the lymphocytes were drained, how did that work?

Othersen: They put the little tube into the thoracic duct and drain off all the lymphocytes.

Fox: Is there a machine that takes the lymphocytes out?

Rajagopalan: It goes back prior to that. When Curtis Artz came here as a chairman, he brought with him a biomedical engineer by the name of Tom Hargest. Tom had developed a pump specially designed to recirculate lymphocytes out of the cannula called the SCIRT (Self Contained Input Regulated Transponder) pump, because the lymphocyte flow was relatively low compared to blood flow, and it also had to prevent the lymph from clotting; there were some special characteristics of the pump, the suction-activated pump that he had designed.

So, this lymph circuit had two tubes: one coming out of the lymph duct and the other one going into the bloodstream, and it's connected to the pump, and the lymph drained through the pump and got pumped back. So, if you wanted to remove the lymphocytes, there are two things. One, you could discard the lymph, or you could put a filter, which is what they

were trying to do; put a filter in the circuit. So, they trapped the lymphocytes but allowed the fluid to go back.

Othersen: I recall those filters had antibodies all through the filter that would grab the lymphocytes as they went through and deplete them, and then they would return the regular lymph fluid, because you needed to get that fluid replaced.

Rajagopalan: Because if you discard all the lymph, then you subject the patient to nutritional depletion. Lymph is an essential nutritious fluid, and if you throw that away, the patient will have serious nutritional consequences. So, you have to give the fluid back but remove the cells. So, the filters were being developed to accomplish that depletion of lymphocytes..

Fox: Were you involved in the recipient and the donor's post-surgery recuperation at all?

Othersen: As part of the team I would make rounds, but I was not in the decision-making process or anything. I was just the one who got the kidney from the donor; Dr. Derrick removed it and gave it to me, then I flushed it out by putting in a solution -- we had a special solution that we would put into the artery and flush out the kidney, and it would cool the kidney down as well as take all the blood out of it.

Fox: Did the special solution have a name? Or what was the process?

Othersen: Well, different people had come up with different solutions for transplantation. It had to be a proper pH, it had to have certain electrolytes in it, and I don't remember that we had a name for it.

Rajagopalan: I don't know what fluid they used at the time, but the solution that subsequently was used was called Collins solution; the other one's called the [Belder] solution. That's used more recently, but I'm not sure that they existed at the time.

Othersen: I think they were developed subsequently. But we used a standard solution that somebody else had come up with.

Rajagopalan: Since you had experimented with anti-lymphocyte serum prior to that, and Dr. [Charles David] Graber had also developed some techniques for developing it, do you recall any discussions about how the decision to use lymph depletion as opposed to anti-lymphocyte serum in preparation?

Othersen: There were discussions about that, because Dr. Graber, who was the immunologist who was part of the team, had had some experience with anti-lymphocyte serum, and there was a discussion about that. But Dr. Artz and Dr. Fitts felt very comfortable with the lymphocyte depletion; they had a done a lot of work on it, they had the engineer all tuned up to that type of thing; and we had not made any anti-lymphocyte serum here. So, that tipped the balance in that direction.

Rajagopalan: If you were to go back and do it again, would you do anything differently?

Othersen: You know, most of the time when you rehash a situation and review it, you say, well, I would've done something differently than that. I don't see that anything differently could have been done. I think it worked very well; the procedure went well; I think it would have been a little easier to do lymphocyte depletion with anti-lymphocyte serum, but it worked as far as this young man was concerned, and I know he survived for about five years. He apparently came back in the hospital after five years.

But I don't think I would do anything differently. We had a pretty good setup. We had an operating team, but also the University President, Dr. [William Mellon] McCord had set up an advisory team to sort of look at the process and advise future transplants; and I was on that team, but I don't think we had to rethink and say we would've done something differently.

Rajagopalan: What can you tell the future doctors and physicians from your experience? What advice can you give?

Othersen: I think the major thing about this process is that it was a team-based concept. As many people have said, you make progress by standing on the shoulders of giants. All of this clinical application was based on a lot of immunological research done by a lot of different people, and there were many people in the labs who had done research on skin grafts from one rat to another and working out the genetics and working out the various drugs that caused lymphocyte depletion and their various ways of causing lymphocyte depletion. So, all of that was an orderly process; it wasn't just somebody going off saying, I'm going to transplant a kidney.

Then it was a process of selecting the donors, and the team approach to doing it so that everybody participates as a team. That's been my biggest concern with any sort of thing that we do for children, like for cancer, is a team approach. There's no question that it's better to have in one room the surgeon who's going to do the operation to remove a tumor, the hematologist, oncologist who's going to treat it with chemotherapy, the radiotherapist, the radiologist, and the pathologist. Those five people are essential, and having them all in one room together, you can't beat that.

And that's what the kidney transplantation taught us, is that the team concept works, and it's best for the patient, and it's best for medicine.

Fox: Do you know why William Ashley was chosen as the first patient?

Othersen: As I said, I was not too involved in that situation. I was just called on because I'd had experience in lymphocyte depletion and in the mechanics of transplantation and in the field of immunology. I mean, I wasn't an immunologist; but I'd had experience in some of the techniques. And so that's why I got involved in it. But as far as deciding who was a good candidate and who should get it, I wasn't involved in that. That was the nephrologist and Dr. Arthur Williams and his team, and at that time what we did was just the mechanical aspects of providing surgical support, like putting in catheters, et cetera.

But it was a good ride, and it was something that was a big step forward when you look back on it. And when you look and see how sort of low-key everybody tried to be; they didn't try to mention a lot of names, because at that time the medical society would've frowned on publicity. It's a far cry from today; no billboards up at that time advertising a hospital. But I didn't regret it, and as you asked, I don't think I would have changed anything.

End of recording.