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Historical Vignettes of Arterial Repair

Recollections of Korea 1951–1953

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At 4 a.m., in the early morning hours of June 25, 1950, a massive artillery and mortar barrage of the North Korean Army along the 38th parallel began. In Washington it was early Saturday afternoon, June 24th. Four hours after the attack began, it was apparent in the capital of South Korea that this was not simply another border raid. The US Ambassador in Seoul cabled the State Department in Washington: "North Korean forces invaded the Republic of Korea at several places this morning . . . It would appear from the nature of the attack and the manner in which it was launched that it constitutes an all-out offense against the Republic of Korea." As the midnight approached on June 27th, a resolution was passed by the United Nations' Security Council calling upon member nations to "render such assistance to the Republic of Korea as may be necessary to repel the armed attack and to restore international peace and security in the area."[1]

On the afternoon of that attack, I had just that week finished surgical residency in Philadelphia, and heard the news with my wife and children as we drove to my new position on the staff of Dr. Michael DeBakey in Houston, Texas.

The medical services of the United States military were ill prepared for war in 1950. Before the outbreak of hostilities, President Harry S Truman had directed Mr. Louis Johnson of West Virginia, the Secretary of Defense, to reduce the budget of the armed forces. As one result of that order, many of the middle grade officers in the medical services: majors, lieutenant colonels, and others, had retired from the service. In an effort to protect the security of the nation, Dr. Frank Berry, a distinguished thoracic surgeon of New York and a consultant to the armed services, recommended, and the Department of Defense adopted, the "Berry Plan." Graduates of medical schools at that time were subject to the "doctor draft" upon the completion of an internship. The Berry Plan provided deferment for selected physicians to undertake residency training in civilian hospitals. Short of a national emergency, the residents would be deferred until the completion of their residency, at which time they would be subject to active duty. The plan was in operation at the time of the outbreak of hostilities in Korea. With the outbreak of war, these residents, having been in training for 1 to 2 years, were immediately called to active duty, and many were sent to the combat theater. It was these young medical officers, with 1 or 2 years of training, who, under the administration of senior regular army medical officers, provided the bulk of the medical and surgical care at the MASH and evacuation hospitals in Korea. Most of the battalion-aid surgeons had completed an internship of 1 year's duration.

Without any course of indoctrination relative to military service, I departed Andrews Air Force Base near Washington, D.C., on Pearl Harbor Day, December 7, 1951. Based at the Walter Reed Army Medical Center, I was assigned on temporary duty to South Korea. My orders were to organize and direct a United States Army Surgical Research team in Korea. The team had the wonderful mission of "seeking means of improving the care of battle casualties." On arrival in Korea I believe I was one of only two board-certified surgeons in the Korean theater and was only 1 year out of residency training.

South Korea in 1951 was a starving country. Agriculturally based, the staple of importance was rice. People lived in thatched roof huts. Much of the daily transport was by the A-frame on the backs of the peasants. Farming was performed by hand with an occasional plow being pulled by water buffalo. Throughout my tour in Korea, I never saw a hotel, a restaurant, or any form of entertainment other than those militarily based.

The military lines were fairly stable in December 1951, roughly coinciding with the 38th parallel. On the eastern side of the theater, the front lines were often in mountainous terrain. Artillery and mortar fire accounted for many of the injuries. Patrols were frequently in no man's land, resulting in injuries by small arms fire, hand grenades, and land mines. The battalion-aid station was often on the backside of the mountain with the front lines atop the mountain. Casualties were brought to the battalion-aid station on stretchers with subsequent transport to the MASH by land ambulance; the more critically injured were transported

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during daylight hours by helicopters. Each MASH was located approximately 5 miles behind the front lines with orders to be able to dismantle the hospital and move within a period of approximately 8 hours.

As initially organized, the Surgical Research team in Korea consisted of four officers (lieutenants and captains) and four enlisted men. On assignment from Walter Reed, the members of the team were not under the direct control of the combat command and, as such, may have initially been considered a nuisance by officers responsible for fighting a war.

Young, enthusiastic, and probably impatient, I wrote to my commanding officer at Walter Reed, Col. William S. Stone, that the team was not gaining the support it needed from Maj. Gen. William S. Shambora, Surgeon to the Far East Command and consultant to Lt. General Matthew B. Ridgeway. Unknowingly, but doubtlessly meant to gain support for the team, Col. Stone "bucked" the letter through to Gen. Shambora in Tokyo. Shortly thereafter, at the MASH, our sergeant called: "Captain Howard, you are wanted on the telephone, Tokyo calling." Anyone who has utilized the field telephones knows what a problem their use can be. The telephone lines are often strung out on the ground over hundreds of miles, passing through multiple exchanges, often providing difficult communication. Often unable to get through to your destination—often unable to hear—often a frustrating experience.

Picking up the phone I said, "Captain Howard speaking."

A voice came over the lines as clear as crystal. "Captain, General William Shambora, Tokyo. Captain, if you have anything to say to me, say it directly to me." End of conversation. A scared captain. An unforgettable conversation.

What was the status of arterial surgery in the military service in 1951? DeBakey and Simeone[2] had reviewed the results of the management of approximately 2500 arterial wounds in World War II. The treatment had been ligation. The resulting ischemia, made worse by destruction of soft tissue collaterals around the arterial wound, had led to an amputation rate of 49% after ligation of a major artery. Their report had included 81 arterial injuries that had been repaired primarily in World War II. These were, I believe, largely limited to injuries of the lateral arterial wall that lent themselves to simple suture. The results, however, were not good. In civilian life, Professor Craaford in Sweden had developed the operation for coarctation of the aorta in 1945 and I had assisted on a few such operations during his residency. A few months before leaving for Korea, I had scrubbed with Dr. Denton Cooley in, as I recall, the first aneurysmectomy in the Houston series. But most vascular surgery being done consisted of the "Blue Baby" operation. Drs. Alfred Blalock and Helen Taussig had developed the operation at Johns Hopkins and, as discussed later, the Potts ductus vascular clamps were utilized in the operation.

In Korea we first attempted repair of arterial injuries utilizing hemostats as our basic instrument. Direct repair was technically achieved but the anastomoses thrombosed and amputations frequently resulted. The hemostat, with its teeth opposing each other, resulted in the crushing of the tissue and was responsible for the subsequent thrombosis. We took the hemostats to the Eighth Army field engineers and asked them to adjust the clamps, so as to make the teeth interdigitate rather than oppose; thereby adopting the principle of the vascular clamp. The engineers graciously cooperated but the modified clamps produced no better results. Amputations continued.

In late 1950, back at Walter Reed, a small unit consisting of one staff surgeon and one resident was receiving from the combat theater casualties with arteriovenous fistulas and false aneurysms resulting from combat injuries. Arriving back at Walter Reed, perhaps a month or later after injury, the casualties were studied and operation was often deferred with the goal of achieving improved collateral circulation as protection against failure of the repair. Repair was then performed, perhaps 1 to 4 months after the initial injury. The results were good.

In consultation with Brig. Gen. Sam Seeley, Chief of Surgery at Walter Reed Hospital and Col. William S. Stone, Commandant of the Army Medical Service Graduate School at Walter Reed, arrangements were made for Maj. Ed Jahnke, the resident on the vascular repair team, to come to Korea for 3 months as a member of our research team. Major Jahnke, bringing with him a pair of Potts ductus clamps, joined the team on temporary duty in 1952. The results of arterial repair took a dramatic turn for the better. Repairs were successful.

I then requested of my commanding officer, Col. Stone, that six pair of the Potts ductus vascular clamps be forwarded to Korea, one pair for each of the six MASH hospitals. The following correspondence with the manufacturer of the Potts ductus clamp, as subsequently related to the author by Colonel Stone, ensued.

To: the Manufacturer of the Potts Ductus Vascular Clamps:

"Urgently needed for use in Korea - six pair of Potts Ductus Vascular Clamps"

Colonel William S. Stone, MC, USA
Commanding
Army Medical Service Graduate School
Walter Reed Army Medical Center

Immediate reply from the manufacturer:

To: Colonel William S. Stone, MC, USA

"There is a backlog of orders for the Potts ductus clamps because of their widespread utilization in civilian hospitals for the Blue Baby operation. There will be a delay of several months in filling your order."

Immediate reply:

To: The manufacturer of the Potts Ductus Vascular Clamps:

You will supply the United States Army with 6 pair of Potts ductus vascular clamps within a period of two weeks

or the United States Army will break your patent and manufacture them themselves."

Result: Seven pairs of vascular clamps, the extra one for the marine hospital in Korea where Lt. (jg) Frank Spencer was attempting acute vascular repairs using the Blalock rubber-covered bulldog clamps.

Lieutenant Colonel Carl Hughes, the staff surgeon of the vascular unit at Walter Reed, then came to Korea on temporary duty as a member of our research team, bringing the additional Potts ductus clamps. [The results of repair, subsequently published by Major Jahnke,[3] Colonel Hughes,[4] myself and my colleagues[5] were quite an improvement, the amputation rate falling from 49% during World War II to approximately 7% to 13%.]

Brigadier General Holmes Ginn, Surgeon to the Eighth United States Army in Korea, had an order sent to each MASH hospital that two surgeons from each hospital would be sent to the 43rd Surgical Hospital, formerly the 8055 MASH, for several days' instruction in vascular surgery. From each hospital, two young surgeons, having completed 1 or 2 years of surgical residency and having gained experience for perhaps a year in combat surgery, (and doing a splendid job), reported. A second order went out to various units of the military police in South Korea to pick up any stray dogs and send them to the 43rd Surgical Hospital where Colonel Hughes was based. Several surgeons arrived on schedule, but there were no dogs. The idea, of course, was to allow the surgeons to perform a few vascular repairs on dogs, provide them with vascular clamps, and return them to their MASH units. Disappointed, the surgeons spent the first evening in the Officer's Club. But during the evening one dog arrived by helicopter from perhaps 50 to 60 miles away, and another was flown in from Pusan, hundreds of miles away. By morning, there were dogs and surgeons. At each operating table, two surgeons repaired first an iliac artery on the right and then the femoral artery. Two other surgeons across the operating table performed similar operations on the left "lower" extremity. The next day the procedures were repeated on the "upper" extremities. Each pair of MASH surgeons performed approximately four to eight repairs and was equipped with Potts ductus clamps. They returned to their MASH hospitals having completed the first vascular fellowship and, as a figure of speech, having been "certified for special vascular competence."

The MASH hospitals in Korea were under varying regulations that casualties entering the MASH and being operated upon, should, if not capable of returning to active duty within perhaps 5 to 7 days, be evacuated to the hospitals further south in Korea, or to Tokyo and the United States. But the MASH hospitals were not too busy at that time, as the flow of casualties was limited. The word came that Gen. William S. Shambora was coming to Korea and was to visit our MASH hospital. In our obvious effort to impress the General, we held our patients with successful arterial repairs beyond the regulation period. The day came for General Shambora's visit and after he had visited with the hospital administration we asked if he would like to make rounds in the hospital. "Certainly," he replied, and as we entered the tent hospital and walked down the aisle between the rows of cots, partially in the author's fantasy, the following conversation occurred.

"General Shambora, may I present Captain Smith. Captain Smith was wounded two days ago, a fragment wound of the lung. He is doing well, General."

"General Shambora, may we present Pfc. Johnson. Pfc. Johnson received a bullet wound of the left femoral artery two days ago. It was successfully repaired. Feel his pulse, General." A bounding pulse at the foot!

"General Shambora, Corporal Brown received a perforating wound to the abdomen five days ago. Small bowel repair, colostomy, low-grade fever, but doing well."

"General Shambora, ROK soldier Kim, injured on patrol last night, fragment wound of the brachial artery. Successfully repaired. Feel his pulse, General." And as I would have you believe, every second or third patient had a successful arterial repair. General Shambora was not fooled. He had been in the army throughout his life. But he said nothing.

That night, after mess, a message came that General Shambora wanted to see me in his tent. A small tent, lit by a Coleman lantern—the major general in his undershirt sitting there on a stool—one extra stool.

"Have a seat, Captain. Have a drink." A few minutes of casual conversation and then, "Captain, what can I do to help you?" Words engraved in a young officer's mind for half a century.

During those months, a new specialty blossomed across the land. The incidence of amputations across the Korean peninsula plummeted. "And soldiers walked . . . who might have not."

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