An Unlikely Marriage: Life As a Wrist Surgeon and Career Officer in the U.S. Navy

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I appreciate the opportunity to describe the origins of my interest in wrist surgery, the major contributions I have made to the field, and some of the people who have helped me succeed along the way. But to do this, I need to consider my professional career in its fullest context. There is no way that my role as a hand surgeon can be separated from my life as a naval officer, even though I have been retired from the navy for quite a while now. Most of the contributions I consider significant were accomplished while I was on active duty, moving from place to place every three years and taking on increasingly more complex roles of organizational responsibility and leadership. Few resources were actually made available to senior officers for meaningful academic practice. So, with your indulgence, I am going to interweave some of the highlights of my navy career as I muse about my concurrent interest and passion for the field of hand and wrist surgery.

The year was 1976 and, as a newly minted navy hand surgeon, I had far more questions about the wrist than answers. I was learning that wrist disorders were both an occupational hazard for sailors and an unsolved clinical mystery for orthopedic surgeons. Unable to find straightforward answers for many of my patients' conditions, I improvised surgical solutions based on what little evidence was available. I'm referring to conditions like advanced Kienböck disease in a young navy deckhand, a corpsman (medic) with an unidentifiable wrist clunk, a carrier pilot with posttraumatic distal radioulnar joint (DRUJ) dysfunction, and a retired rear admiral with scaphoid nonunion and collapse, and the list goes on.

Then one day, in the fall of 1976, J. Leonard Goldner (►Fig. 1) came to Bethesda Naval Hospital as our visiting hand professor (►Fig. 2). Eager to learn from my own struggles with these difficult cases, I presented a series of them to Dr. Goldner, hoping to benefit from his vast experience. After keeping silent for most of the session, I recall his concluding remarks, "I don't have the answers you are looking for, David. But stick with these interesting wrists, I think you are really on to something." Coming from Dr. Goldner, I felt

that this advice was worth following. And although this event is not what first got me interested in wrist surgery, it is definitely what got me *excited* about it.

What got me *interested* in the wrist was a suggestion, two years earlier, by my fellowship director Jim Wilson of San Diego (►Fig. 3), a former partner of Joe Boyes and Herb Stark of Los Angeles. Jim was a good friend of Al Swanson and had been putting Al's silicone lunate implants into wrists for both early and late cases of Kienböck disease. Jim was convinced that once the lunate collapsed (late cases), the results of implant arthroplasty were inferior to those when the implant was inserted before lunate collapse (early). Jim asked me to have a paper ready for presentation at the American Orthopaedic Association (AOA) meeting in San Francisco in June 1977. The paper was finished on time, and we presented a review of 40 cases from Jim's practice and the Naval Medical Center of San Diego, indicating that (1) conservative treatment was largely unsatisfactory (in the short term) and (2) the short-term results of silicone arthroplasty appeared to be better when performed early in the course of the disease.¹ The paper was well received, and Jim urged me to get it ready for publication. But I felt that it needed a bit more work, particularly in defining exactly what we meant by "early" and "late" disease.

Work on the paper was slowed somewhat by my having to study for the orthopedic Boards and the fact that I was ordered to report to the USS *Independence* as a flight surgeon for a 5-month Mediterranean "cruise". Although I missed my family, I am sure my navy career was enhanced by again going "operational" (I had been a flight surgeon for two years prior to my orthopedic residency) (►Fig. 4). But the Kienböck disease paper had been left in good hands; upon my return to Bethesda, Commander Steve Gunther and Lieutenant Commander Greg Mack had reviewed the cases and were ready to help me sort them into four stages, which are now accepted by many surgeons as representing the natural course of untreated (and sometimes treated) Kienböck disease.

Fig. 1 J. Leonard Goldner, MD.

The Kienböck paper was published in the *Journal of Bone and Joint Surgery* in 1977,² not long after Dr. Goldner's visit to Bethesda. The purpose of the paper was to show that silicone arthroplasty was best performed in the early stages before lunate collapse. The staging system, an afterthought, was introduced as a way to differentiate the early from the late stages of lunate collapse. At the time, we had no inkling of the soon-to-be discovered reaction of synovial tissue to particulate silicone (which provided me with much clinical material for future publications),³⁻⁵ and no expectation that our classification system would end up as the only memorable part of the original paper. At any rate, by the end of 1977 my interest in wrist disorders was totally stimulated—enough so that I began to have hopes of someday sharing my own experiences with the current masters of wrist surgery at various panels and symposia.

But before that would happen, I had to solve one more mystery. My navy corpsman with the unidentified wrist clunk would not settle for the wrist splinting that had been prescribed for her. After having undergone unsuccessful previous surgery (elsewhere) for what appeared to be a subluxating DRUJ, she agreed for me to explore the ulnar side of her wrist, including the DRUJ and triquetrohamate (TH) articulations. What I found was profound ulnar-sided laxity between the proximal and distal rows, which I attributed to insufficiency of the ulnar arm of the arcuate ligament. Not having sufficient local tissue to reef the ligaments, I used a slip of the extensor carpi ulnaris (ECU) to secure the TH articulation, inspired by

Fig. 3 James N. Wilson, MD.

Fig. 2 Bethesda Hand Service: (left to right) Dr. Lichtman and Dr. Mack with visiting residents from Germany and George Washington University.

Dobyns and Linscheid's then-popular scapholunate repair. Convinced that I had discovered the source as well as a possible treatment for this condition, I named it ulnar midcarpal instability (MCI), to distinguish this entity from the widely recognized scapholunate (SL) instability.

Shortly after I operated on the Navy corpsman, one of the radiologists at Bethesda presented to me with very similar symptoms and findings: an ulnar sided, painful wrist clunk that occurred only as the wrist was moved into ulnar deviation. In the neutral position the wrist seemed to sag into a volar intercalated segment instability (VISI) deformity (►Fig. 5), which indeed, was confirmed on neutral nonstress wrist X-rays. Being a good teaching radiologist, he agreed to undergo cine-roentgenograms of his wrist in multiple planes while repeatedly recreating his wrist clunk. The two of us then pored over the video, replaying the sequences continuously until we were able to synchronize the various motions and views with the wrist clunk. The first thing we noticed was that there were no proximal row dissociative lesions

Fig. 4 Dr. Lichtman as young U.S. Navy flight surgeon boarding F-4 Phantom jet.

Fig. 5 Left wrist showing typical appearance of midcarpal instability.

Fig. 6 Reduction of wrist sag by applying dorsally directed pressure on pisiform.

(although the use of the term “dissociative” had not yet been introduced in that context by Drs. Dobyns and Linscheid). Second, we noted that the proximal row snapped suddenly from its VISI stance in neutral to a dorsally facing (DISI) stance coinciding with the painful wrist clunk. We also noticed that in the normal wrist the two rows glided smoothly into their respective positions with ulnar and radial deviation (proximal row flexion with radial and proximal row extension with ulnar deviation). Finally, we did not need to operate on my colleague’s wrist because we learned that, by pushing on his pisiform dorsally, we could completely eliminate the clunk (→**Fig. 6**). By working cooperatively with our therapists to reproduce this corrective force, we developed the first wrist splint specifically designed for MCI.

In late 1977 I moved from Bethesda to Oakland Naval Hospital as department chairman and residency director, where I continued to study midcarpal kinematics, this time collaborating with my former resident and my first hand fellow, Commander Jim Schneider (→**Fig. 7**). Jim and I dissected several fresh wrist specimens, first carefully studying the normal kinematics and then cutting various combinations of ligaments to reproduce, as closely as possible, our clinical observations about midcarpal instability. Coincident with performing these dissections, we saw several more patients and operated on them for MCI, which gave us further understanding of the correlation between the clinical (and radiographic) findings and the underlying pathophysiology

Fig. 7 Commander Jim Schneider, MD, US Navy.

and kinematics. We didn’t have any sophisticated engineering devices at our hospital—just our curiosity and lots of observations, photography, and direct measurements in the anatomy laboratory and in the OR.

More than just gaining an understanding of a previously undescribed condition (MCI), this experience also gave us a greater understanding of the mechanics and pathomechanics of the wrist. The more we concentrated on what we were seeing in the dissecting room and OR, the more convinced I was that the popular concept of the columnar (longitudinal) wrist and the associated columnar instability patterns were creating a general misunderstanding of the normal wrist and its various instabilities. I began seeing the wrist as two balanced, transverse rows—an intercalated proximal row and a rigid distal row—whose interactive surfaces, particularly at the ST and TH joints, created a specific and predictable motion and, when disrupted, predictable intercalated deformities. In my mind, the wrist was a perfectly balanced ring of carpal bones linked by the midcarpal joint with reactive forces, acting principally at the TH and SL joints. Perhaps because of my fondness for Richard Wagner’s *Ring Cycle*, or perhaps because of J.R.R. Tolkien’s *Lord of the Rings*, in later publications I referred to this concept of wrist kinematics as the “ring theory.”

In 1980 Jim Schneider and I submitted our abstract, “MCI: A Clinical and Laboratory Analysis,” to the American Society for Surgery of the Hand (ASSH) for presentation at the annual meeting. Fortunately, the paper was accepted for presentation and I was asked to participate in a panel discussion on carpal instabilities.⁶ I spoke specifically about MCI but also introduced the ring theory of carpal kinematics, which challenged conventional columnar and “slider crank” concepts. The timing was fortunate, because the topic of wrist pathology and kinematics was a hot one, with such leaders as Drs. Dobyns, Linscheid, Taleisnik, Watson, Green, O’Brien, and Bowers in great demand on the lecture circuit. The exciting new field of wrist arthroscopy was also being developed at the time by Drs. Jim Roth, Terry Whipple, and Gary G. Poehling.

After appearing on several more panels with the recognized giants in the field, along with a few other newcomers and wannabes like myself, I realized that the material we were

Fig. 8 John Niebauer, MD.

Fig. 9 Harry Buncke, MD.

discussing had never been synthesized and organized into a cohesive single publication, so I approached the WB Saunders Company (WBS) about publishing a multiauthored textbook on the wrist. They thought it would be a good idea to test the waters with a volume of *Orthopaedic Clinics of North America* devoted entirely to the wrist, which was published in 1984.⁷ Its popularity encouraged us to go forward with the first multiauthored textbook on the wrist, entitled *The Wrist and Its Disorders*, published by WBS in 1988.⁸ For the most part, the chapters were written by many of the newcomers and wannabes, most of whom are now masters in their own right. The second edition was published in 1997 with the assistance of my good friend and colleague, Captain A. Herbert Alexander, USN.⁹

As I was promoted to more senior positions in the Navy, I found less time to devote to research and innovation; still, I stubbornly refused to give up my clinical practice and teaching. Although my friends and colleagues in the civilian hand and orthopedic communities saw me primarily as a practicing surgeon who happened to achieve high military rank, my

military assignments called for a full-time administrator and naval commander. I did find time, however, to establish a civilian/Navy hand surgery fellowship in the Bay Area in conjunction with Dr. John Niebauer (→**Fig. 8**) and his colleagues in San Francisco. And some years later, Dr. Jim Schneider and I worked with Harry Buncke, MD (→**Fig. 9**), to develop a Navy Microsurgery Training Laboratory at the Oakland Naval Hospital, which was later transferred to the Uniformed Services University of the Health Sciences in Bethesda as the microsurgery training center for all military services. One of our more newsworthy contributions was the return of four active military personnel—including one F-14 carrier pilot—to full duty status after undergoing toe-to-thumb transplantations (→**Fig. 10–13**).

In 1987, while acting as director of surgical services at Bethesda Naval Hospital, I was notified of my selection to the rank of rear admiral, lower half. This resulted in my having to turn down military retirement as well as a previously offered “dream job” as director of hand and upper extremity surgery at the University of Washington in Seattle. The selection was

Fig. 10 Preoperative palmar view of left hand.

Fig. 11 Preoperative view of big toe used in toe-to-thumb replacement.

Fig. 12 Postoperative palmar view of hand with big toe transplant.

unexpected, yet, after having spent my entire career in an organization that I deeply respected, I couldn't turn down this unique opportunity for leadership. So, instead, I was promoted and assigned as Commander, Navy Medical Command Northwest Region, which meant that I was responsible for all the navy medical and dental facilities reaching from central California to the Aleutian Islands. As an additional task, I was "ordered" to establish and run a joint Army-Navy medical command in San Francisco, which combined operations of the Bay Area's two largest teaching hospitals: Letterman Army Hospital and Oakland Naval Hospital (Oak Knoll).

Wow! It was a busy time, first responding to the 1989 Loma Prieta earthquake and then coordinating the region's response to Desert Storm, which included organizing the personnel and equipment for the U.S. Hospital Ship *Mercy* (docked at the Oakland Army Base shipyard) and then indoc-

Fig. 13 Postoperative dorsal view of hand with big toe transplant.

trinating all the reservists who replaced our deployed regular hospital staff. Throughout this activity, both hospitals continued to train residents and care for patients without a noticeable decrease in overall productivity or quality. In fact, the reservists performed remarkably well, organizing new, efficient services such as after-hours clinics and ambulatory surgery centers.

Personally, I continued to see patients and perform hand/wrist surgery on a regular basis. It was a little unusual for a navy flag officer to continue in this role, but I had learned from my naval aviation colleagues that good leadership requires understanding and, often, participating in the essential missions of the command. Clearly, this paid off, because in January 1991, I was promoted to rear admiral, upper half (two stars) and was given my ultimate navy assignment: Commander of the National Naval Medical Center Bethesda, the Navy's flagship hospital (►Fig. 14).

Fortunately, during all my senior assignments, there were excellent residents and hand surgeons to back me up and care for my patients while I was away from home. Three who deserve special recognition are Randy Culp and Charlotte Alexander at Oak Knoll and Haydee Kimmich at Bethesda (►Fig. 15). Never having completed a hand fellowship, Dr. Kimmich was still an exceptional hand surgeon and a superb naval officer. All three of these individuals were outstanding surgeons and teachers, to whom I am greatly indebted. In fact, throughout my career I have included residents and fellows as coauthors on almost every publication. Their number makes it impossible to list them all here, but, as I look through my CV, I remember with fondness working with them all. They certainly have enabled me to accomplish far more than I could otherwise have done on my own.

After retirement from the Navy in 1994, I accepted a position at Baylor College of Medicine in Houston as head of the hand surgery service and director of its orthopedic hand fellowship. My good friend and colleague Mike Epstein and his wife Cathy made it possible for Frankie and me to

Fig. 14 Rear Admiral Lichtman with Bethesda Navy Hospital Color Guard.

Fig. 15 Captain Haydee Kimmich, MD U.S. Navy.

make this difficult transition to civilian life. After four years of adjusting to civilian practice at Baylor, I accepted my current position as chairman of orthopedic surgery and residency program at John Peter Smith Hospital and (subsequently) at the University of North Texas in Fort Worth. Although I still enjoy practicing and teaching hand surgery, my focus now is more on residency education, group practice development, and organizational leadership. Unquestionably, the most fulfilling activity for me in recent years has been my service as President of the ASSH.

In summary, I have had two parallel and fulfilling careers: one as a U.S. Navy medical officer and the other as an academic hand and wrist surgeon. Although the two represent very separate career pathways, to me they are complete-

ly linked. I would never have been given such responsible positions in the U.S. Navy without having had a credible foundation in an important clinical specialty, and I would never have ascended as far in the ASSH had I not experienced the leadership lessons I learned in the Navy.¹⁰ At this point in my career I feel quite fortunate and privileged to have devoted so much of my professional career to the two organizations that I respect most deeply.

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