Going Bionic:
My Journey Through Double Hip Replacement
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Dedication

I wrote down my story out of deep gratitude to Dr. Nicholas Mast, his surgical team, and the medical staff of California Pacific Medical Center in San Francisco, with the hope that my story will help others deal more effectively with degenerative hip arthritis and replacement surgery.

My Active Lifestyle

I've always been very active out-of-doors. As a kid it was all about tide-pooling, exploring sea caves, climbing trees, and hiking in the hills. As a teenager, surfing, snorkeling and scuba diving, running, and a little cycling and skiing got added to the mix. Then into adulthood the skiing increased, and kayaking, snowboarding, windsurfing, and kiteboarding were thrown in.

I was never into competition or extreme sports, but was very much into full immersion, to the point on occasion of having some truly epic adventures, but mostly without injury. In fact, the worst injuries by far resulted from a head-on vehicular collision in Baja on a surf trip, in which my knee and face were badly damaged. I managed to fully recover within a year, but always thought that if I were to have problems later in life, it would involve my injured knee.

I should also mention that I went into landscaping as a career, and during the early years I was very physically involved in the layout and installation process, including extensive trail projects. I now do mostly design as a landscape architect, but the physical aspects my career evolution are likely relevant to the current discussion.

Onset and Diagnosis

Fast forward to my early 50's. My knee had ended up causing no apparent problems so far. A mild shoulder injury from kayaking (bracing too hard with my paddle) was also not causing any problems. A several-year bout with lower back pain, probably induced my a mix of early life injuries, too much lifting of heavy landscaping materials, too much office time, and really stupid kayaking moves to induce nose and tail stands, had finally subsided. I even pulled off a couple month-long working vacations on the coast to re-kindle surfing, with great success. Then, fairly abruptly, everything started to unravel.

The first hint of hip problems involved very subtle twinges in one or the other hip, causing me to momentarily limp. I could shake it off with a short spurt of jogging, but it kept coming back and gradually got worse. I went in for my first check-up, suspecting sciatica since I'd recently had lower back problems, but the X-ray and MRI evidence was inconclusive.

As time went on, however, I began to lose significant diagonal range-of-motion in my hips. It got to the point where I could no longer straddle a surfboard without pain, which in turn sabotaged my attempts to get to my feet on a wave. I had increasing difficulty getting my leg over a bicycle and climbing over a fence. Skate skiing and ice skating fell by the wayside. Long walks, trail flagging

sessions, and more than a couple hours of skiing would leave me in so much pain I couldn't sleep at night without medication. Standing up after long periods of sitting, especially at gas stations during long drives, would leave me hanging onto the car for a couple minutes to let the pain subside and the strength return so that I could walk. I was a mess. Follow-up X-rays confirmed that I had degenerative osteoarthritis of the hips.

Possible Causes

My first reaction was how could this possibly be happening to me?! I didn't think that I had abused or overly used my hips, but possible causative factors gradually came to light in discussing the X-rays with orthopedists and thinking back on things I'd done that might have contributed.

Turns out that in my case there were 3 potential contributing factors: congenital; teenage injury; and later-in-life over-use. The sockets of my hip joints appeared undersized (congenital), which meant that the force per square inch on bearing surfaces was greater. The ball part of the joints appeared deformed, which results from damage to the growth plates of the bone during development (termed "slipped capital femoral epiphysis"). Too many dump things as a kid, like jumping off of cliffs, the roof of my house, and out of trees, may have caused the deformation.

And then, the final blow, becoming a weekend warrior in my mid-thirties to mid-fifties. Days and weeks at a time working at a desk, abruptly interrupted with extremely physically demanding days telemark skiing or flagging trails in very rugged terrain without being in shape. The old adage, muscles protects joints, is so true. Once the muscles fatigue, the joints take all the impacts.

Not to over-analyze this, because the unfortunate reality of degenerative osteoarthritis is that once it progresses, it becomes irreversible and only gets worse over time. The most important aspect of looking at the likely causes is not in determining the best treatment, but rather in coming to terms with the full reality that if I didn't seek treatment I would lose my ability to be active out-of-doors and would live in a world of ever-increasing chronic pain. This was the beginning of coming to peace with undertaking a procedure as radical and irreversible as replacing your natural hip joints with something manmade.

Research and Second Opinions

Once I accepted the realization that hip replacement was in my future, my wife and I began a very thorough Internet search regarding surgical methods and hardware of hip replacement. We also began seeking second opinions from various orthopedists regarding when to do it, what were the risks, how long would the artificial hips last, and what physical limitations would I have after replacement.

There were other people in my life who had gone through this who played a key role in my being very thorough about my research:

- My surfing partner in my Baja wreck suffered a broken ball of one hip that subsequently led to avascular necrosis (AVN). He eventually had a single hip replacement about 15 years ago, returned to surfing, and is doing well.

- An acquaintance where I live had congenital hip problems that eventually required treatment. He had a double hip replacement about 10 years ago at a local rural hospital using the posterior approach. One hip subsequently developed a very bad staph infection, and after several failed surgeries, the artificial hip on that side was removed and he now relies on crutches to get around.

- A college roommate of mine who became a semi-pro surfer also had congenital hip problems. He started with a partial replacement that failed, and ended up with a full replacement 2 years ago involving an anterior approach using a sports-oriented orthopedist in a large metropolitan area (Los Angeles). He is now surfing as well as before the replacement. He elected to go with a metal-on-metal hip, however, in order to maximize resilience to athletic activities. The use of metal-on-metal hardware was of particular concern to me based on recent articles regarding the high toxicity of particles produced by wearing of the joint surfaces.

- Another local acquaintance had a single anterior-approach hip replacement last year by Dr. Mast. His results were completely positive and a great inspiration for me.

Regarding second opinions, I eventually went to 5 orthopedists. The first two worked out of a local rural hospital and were not cutting-edge. The third was in a more urbanized area but near the end of his career and also not cutting-edge. The fourth was in an urbanized area and used a simplified version of the anterior approach, but had a very strong attitude that I could not return to my sports of interest following replacement.

I also discussed this matter with an avid long-distance running friend of mine who works as an emergency room doctor in San Luis Obispo. He basically said that the only way to be fully cutting-edge was to find an orthopedist in either the Los Angeles area or Bay Area. This, coupled with our Internet research and the recent experience of a local acquaintance, led to a decision to schedule an appointment with Dr. Mast.

The appointment was extremely positive. Dr. Mast keyed right in on the extent of my hip degeneration, the need for action, and the benefits of acting sooner rather than later. He also turned out to be very likable and down to earth, especially for someone with his skill-set and prominence in the orthopedic world. And he is an avid surfer and sailboarder, so he understood implicitly my concerns about returning to outdoor activities after replacement.

Based on the experiences of the other artificial hip recipients I knew, the feedback from the various orthopedists I saw (most notably Dr. Mast), and our extensive Internet research, my wife and I came to the following conclusions:

- Use a sports-oriented orthopedist such as Dr. Mast who works only on hips, practices in a large metropolitan area, has fellowships in the practice, uses the anterior approach with no muscle cutting, and utilizes a highly-specialized operating table that facilitates this approach.

- Use cement-less titanium implants in the femur and pelvis. You will be able to apply full bearing pressure on these implants immediately after surgery (meaning that you can immediately start walking), and your bone will grow around them over the next couple of months after surgery, resulting in the strongest possible bond.

- Use larger-sized ball-and-socket bearing surfaces custom-fitted to your body that more closely resemble a natural hip joint, provide a greater bearing surface, and minimize the risk of future hip dislocation.

- Research and discuss very thoroughly with your surgeon the pros and cons of various bearing surface materials. I went with highly-crosslinked polyethylene sockets and alumina-zirconium reinforced ceramic balls. This combination wears more slowly than metal-on-metal, produces inert wear byproducts, and has the resilience to withstand the types of physical activities that I wanted to return to.

- Have the surgery done in a facility that uses all of the latest precautions to minimize the risk of infection during and after surgery. I ended up at California Pacific Medical Center in San Francisco–a stellar institution that I cannot say enough good things about. I arrived thinking I would be just a number in a big-city facility, and discovered that they were not only completely dialed-in procedurally, but have a very personable and caring staff.

Acceptance and Action

After all the research and professional opinions, after 7 years since the onset of symptoms, and after several years of not being able to do many of the sports I loved, I finally fully accepted the reality that I had 2 basic choices: go bionic and retain the ability to stay healthy and active out-of-doors for many coming years; or continue devolving to the point of using pain medications full time and relying on various devices (cane, walker, wheelchair) to help me move around the rest of my life. The choice ended up being easy.

This is not to say that I wasn't fully aware of the no-turning-back nature of cutting out your own bone and replacing it with inanimate materials, the implications of infection, the intrinsic limits sports-wise of even the best of bionic hardware, and the fact that my knees, back, shoulder, and other body parts could still cause problems in the future.

Sort of like fixing an old car–once you replace one component, something else goes wrong. So I didn't go into this with any delusions that it would be a fix-all panacea. On the other hand, and unlike an old car, I knew that if I could stay physically active I would prolong my overall physical health much longer than succumbing to inactivity for the rest of my life. Also, unlike arthritis, other ailments like loss of range-of-motion can be reversed.

But the omnipresent question of "when" still loomed large. The one thing all of the orthopedists agreed on, other than the fact that I had incurable degenerative arthritis, was that it was better to undergo a hip replacement sooner than later. There are several very important reasons for this:

- Give yourself the most productive years of benefitting from the procedure, rather than waiting until you are on your last leg (perhaps literally).

- The stronger and healthier you are going into surgery, the faster and better you will recover after surgery.

- The less progressed the arthritis and associated inflammation, the less difficult and traumatic the surgery. I lost more blood than normal and the procedure took longer because of major inflammation in my worst hip.

- The technology has evolved to the point where the bearing surfaces not only last a very long time, but if you do need replacement (called "revision surgery"), the bone implants are kept in place and the bearing surfaces can be unbolted and replaced, much like taking your car into the mechanic for new wheel bearings.

The last decision for me started as more of a casual question. I had been advised by other orthopedists to have one hip replaced at a time, with at least 3 moths between surgeries. I still had vivid memories of my knee surgery, however, in which the repaired knee was placed in a full leg cast for 2 months and my injured leg emerged as skin and bones, whereas the other leg had grown to twice it's normal size. It took over a year to regain symmetry, and in the interim my stride and posture were way out of balance. Also, with one of my hips degenerating faster than the other, I was once again losing symmetry. So I asked Dr. Mast what he thought about doing both hips at once. His response was that given my otherwise good health, relatively young age (59), and reduced trauma and faster recovery of his anterior approach, he thought it was a good idea. When pressed on it, he said he would recommend it to his own brother and that he viewed his patients as family. I didn't need any more convincing after that. It seemed much more efficient, and I really wanted my new start to involve both legs being equal. The fallback during surgery would be that after replacing the worst hip first, if there were any overwhelming complications, he could stop at one hip and defer the other for another time.

The final action in all of this is of course a leap of faith that you are absolutely ready and that you can place complete trust in the surgeon, his or her assistants, the hospital, and the manufacturers of the hardware. I went into surgery in almost a Zen state of complete acceptance, trust, readiness, and calm–even to the point where I didn't need Valium as a prelude to anesthesia. I was so relaxed that I was asking all kinds of questions about the operating table and all of the other intricate components in the operating room. The anesthesiologist finally had to intervene and politely say that she needed to knock me out so they could get to work! It was actually my wife who was wrought with stress over the pending surgery and could have used some anesthetics of her own!

Preparation for Surgery

In many respects the single most important thing you can do to prepare for surgery is to be as healthy as possible. This means eating well, not being too over-weight, not smoking, not over-medicating, having a strong cardio-vascular system, having good blood health, and having good muscle mass and strength, all of this of course limited to some extent by the bad hips that warrant the surgery in the first place. For me, I could still take several-mile walks, so I did it daily and I included significant uphill walks. For others, maybe swimming or other upper-body workouts are the way to go. Keep in mind that this is elective surgery, not an unplanned visit to the emergency room. You have the time and ability to prepare for this.

Potentially counter to the above is that it helps to minimize inflammation in your upper legs at the time of surgery. Inflamed tissue bleeds profusely and interferes with the intricate procedures involved in hip placement. Pain is the best guide, so exercises that minimize or avoid pain are the

best. Even then, it's not a perfect science. I thought I had it under control, going into surgery with no hip pain or other hints of inflammation, only to find out afterward that one hip was really a mess.

Another key step in preparing for surgery is to have a pint or two of your own blood (referred to as autologous blood) taken for potential use during or after surgery. This blood must be taken no more than 1 month before surgery, and no closer than 1 week before surgery (depending on the time needed by the blood bank to process and deliver the blood to the facility where your surgery will be performed). The challenge is to donate enough for contingencies, but also to balance it against keeping your remaining blood count high for surgery.

The purpose for this is that hip replacement surgery involves a significant amount of blood loss. Much is this is captured, cleaned, and re-infused into your body after surgery, but this blood loses some potency in the process. Your pre-donated blood can make up the difference. If even more is needed, you will need to use blood donated by others. If you want to anticipate this, you can have friends and/or relatives of the same blood type donate additional blood earmarked for your use.

Another key consideration is avoiding any scratches or infections in the weeks prior to surgery. A friend of mine who was scheduled for a double knee replacement decided to take one more aggressive hike a couple weeks prior to surgery, and slipped and scratched her knee. When she showed up at the hospital for surgery, she was promptly sent home to wait a couple months while the scratches healed and the surgery could be re-scheduled.

<u>The Surgical Process and Experience</u>

I've always loved science and medicine, and if the land hadn't called to me more, I would have gone into medicine. So whenever I've needed surgery, I get immersed in the process much like an enthusiastic student yearning for knowledge. Not only is this fulfilling to me, but it has the added benefit of removing myself to a very significant degree from being the patient to being an observer. As a result, I'm more psychologically insulated from the pending physical trauma, pain, and uncertainty of surgical success.

This was perhaps most evident I was walked down the hallways into surgery (I was not on a gurney), passed the No Admittance signs leading to O.R., felt the blast of air flowing outward from the O.R. to keep out pathogens, was briefed by the anesthesiologist (a very personable woman who went by her first name), convinced her that I didn't need valium to be calmed down, and proceeded to the operating room where I was able to check out all of the amazing equipment staged around the very large room and the anti-infection suits worn by the surgical team, all of this before having to be the patient again.

The most significant piece of equipment was the highly specialized table, somewhat lost in the middle of the room, that was key to maximizing success of an anterior approach hip replacement. The table has separate booms that support and articulate each leg independently, boots that hold each foot and make it possible to achieve precise leg length measurements, a central pivot that enables the whole table to twist and turn to maximize access through the relatively small incision (4 inches) to reach the hip joint, and a built-in fluoroscope that can see through the non-metallic table and patient's leg to further enable precise hip replacement.

There's yet another aspect of this experience that for me was very evident afterward. I found myself looking at surgery as being analogous to taking my car to the shop, meeting with the mechanics, dropping the car off, leaving, and returning later to pick it up. The leaving part was when I fell asleep under anesthesia, and the returning later part was when I awoke in post-op seemingly seconds later (3-1/2 hours real time) in complete comfort and with complete lucidity, not having any physical sensation that they had even done anything yet!

Part of that was due to CPMC using a very patient friendly innovation involving a special inflatable gown to which a hose is attached that pumps in warm air to mitigate for the very cold temperature of the operating and recovery rooms to further discourage pathogens. Other factors were that I was still under the influence of an epidural that was used to minimize general anesthesia during surgery, and morphine that was applied directly to the incisions before being sutured closed.

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As it turned out, my first hip involved extensive inflamed muscle tissue which bled profusely and complicated hip replacement. This was not severe enough to abort the second hip replacement, however, which ended up going much better and with much less blood loss. The overall blood loss was more than normal, however, and resulted in use of my salvaged and autologous blood later that evening just to get my blood pressure back to an acceptable level. This worked, but ended up not being enough to get my hemoglobin and red blood cell count up to adequate levels. After 2 days, my skin color was pallid, and my energy level was low. Dr. Mast explained that in this state it would take several weeks at least to re-build my blood, my recovery would be slowed, and my risk of infection could increase.

Had I given a second pint of autologous blood, that might have been sufficient to solve the problem. But since I hadn't, Dr. Mast had no choice but to prescribe 2 pints of donated blood from the blood bank. This was an unanticipated event in my mental preparation for the surgery, but it turns out that blood banks have reduced the risk of disease transmission to a blood recipient to only 1 in 250,000, and if the blood were to be contaminated, it would more likely be due to hepatitis C than AIDS. These odds gave me the assurance to proceed.

The experience of having anonymous donors' blood infused into my body became yet another new step in my medical journey. It began with 2 nurses double-checking my name and blood type and the blood type of the donated blood, then proceeding to infuse the blood into my I.V. one drop at a time, watching like hawks to make sure there was no negative reaction to the donated blood. My wife looked on as my skin color returned to normal within minutes, and I felt my energy level rise strongly in a similar amount of time. It is truly amazing how this medical technique can work so well and so quickly. Since human blood and body parts are donated rather than sold, my moral obligation for receiving this medical miracle is to give back 2 pints to the blood bank when I am fully recovered.

<u>My Hospital Stay</u>

With a single hip replacement, Dr. Mast often has patients out of bed a few hours after surgery to begin walking. In my case, with a double hip replacement, they had me out of bed the next morning. It was painful, but I could walk! A rather profound experience considering what had just been done to me.

Later that day, my hips were X-rayed to confirm what had been a perfect placement. Given my continued medical curiosity, coupled with being encouraged to walk, I was allowed to get off the gurney in radiology and walk over to check out the digital images on the computer screen. Pretty amazing to see such a profound and permanent change inside my own body.

The second day, they had me walk further and do small flights of stairs. On the third day, they showed me tricks to getting dressed and using the toilet and shower. The incisions were sealed with a plastic coating, so patients can begin taking showers when ready.

The nurses were surprised at my rapid recovery and lack of doctor's restrictions on movement, so I asked them why they were surprised. It turned out that double hip replacements are rare, and Dr. Mast is the only surgeon in the Bay Area using the specialized anterior approach that enabled me to get to my feet so quickly.

Had I not lost so much blood, I probably would have been discharged from the hospital on the third day, but my stay ended up being extended for 2 more days. This was far more pleasant that one might think, however, because:

- The care was phenomenal.
- The food was ordered off a menu and of 5-star restaurant quality.
- I qualified for a single room due to the double surgery, and my wife could join me.
- The room had an incredible view of the city, sunsets, and Golden Gate Bridge.
- I could get up and cruise around or sit in a chair at will.

Getting Home and Getting Around

Getting home proved to be fairly straightforward, even though it was a 5-hour drive. We were instructed to stop every hour so I could walk around to reduce the risk of blood clots in my legs. Getting in and out of the car was fairly easy–the challenge was with the walker. It would hang-up on the slightest irregularities in pavement (cracks and joints in concrete, transitions from concrete to asphalt, grooves between concrete pavers, etc.). After almost getting pitched over the top of the damned thing a couple times, we decided to stop at an outdoor sports store on the way home and buy some trekking poles.

Another problem with a walker is that there is a tendency to lean forward, which works against having a vertical posture while walking. Leaning forward also adds to the risk of getting pitched. I could have switched to crutches, but one of the reasons I had both hips replaced at once was to be symmetrical in my recovery. I was concerned that crutches would cause me to favor one leg over the other. Also, crutches don't allow for a natural walking stride, and they place a lot of the force on the shoulders. Since I could be fully weight-bearing on my new hips, I wanted to have the most natural stride possible. Trekking poles were the answer.

The key considerations in using trekking poles for hip recovery are:

- Buy a high-quality durable brand that will reliably support your weight.
- Buy rubber walking tips to give you traction on pavement and protect floors.
- Adjust their length so that your lower arms are horizontal when in use.

- Use the wrist straps like using ski poles for added support, safety, and comfort.
- Use caution in properly placing poles while using stairs.

The last point is very important because you cannot simultaneously use 2 trekking poles and hold onto a railing. This can be an advantage since you don't need to have a railing, but it adds more risk if you improperly place a pole and lose your balance. If you want to use a railing, you can just use one pole, which would be similar to how a crutch or cane would be used on stairs. An advantage of using 2 poles on stairs is that you have a choice of placing both poles at a time and then stepping one step at a time (which I did at first in the early part of my recovery), or placing one pole at a time and walking up or down the stairs in a normal stride (which I did as my strength improved and pain lessened). I not only used the trekking poles during the day, I also kept them by my bed and used them at night to get to and from the bathroom.

I had such a positive experience with trekking poles that I would recommend having them be part of the in-hospital physical therapy following surgery, along with walkers, crutches, and canes, so that patients can try them out and see if they would be right for them. This would also give the physical therapist an opportunity to demonstrate proper set-up and use of trekking poles, especially on stairs.

Methods and Milestones During Recovery

The single most important way to recover quickly is to get outside every day and do lots of walking, including stairs and non-slippery stable slopes. Walking regains range-of-motion, builds strength, loosens adhesions, reduces risk of blood clots, keeps your cardiovascular system healthy, reduces the amount of pain medication needed, speeds up the healing process, and keeps your spirit high. I walked religiously every day, and progressively increased the distance and difficulty of terrain, but I didn't push myself beyond what felt comfortable for me.

My recovery went quickly. This was probably due to being in good physical condition going into surgery, and following the advice of the surgeon and other medical professionals after surgery, which included not pushing myself too fast yet going with a pace that felt right. I don't smoke, I don't drink much, I'm not over-weight, and I eat well, which all undoubtedly helped.

Key milestones during my recovery, and the rate at which I achieved them, were as follows:

- Day 0: surgery; blood pressure stabilized after by using salvaged and autologous blood.
- Day 1: started walking around room.
- Day 2: walked hallways; trained on stairs, dressing, and using bathroom.
- Day 3: infused with 2 units donated blood; switched to aspirin as blood thinner.
- Day 4: discharged from hospital.
- Day 5: driven home (5 hours with 3 stops); walked at all stops; bought trekking poles.
- Day 6: back in my office (very important to me since I'm self-employed).
- Day 7: walked ½ mile.
- Day 8: walked 3/4 mile.
- Day 9: walked 1 mile.
- Day 11: walked 2 miles; stopped using trekking poles around house.
- Day 15: last day of taking long naps; cut narcotic pain medicine dose in half.
- Day 16: stopped narcotic pain medicine and started driving; leg bruising cleared up.
- Day 17: started doing yard work; walked 1 mile without poles; slept on sides (incisions).

- Day 18: walked 2-1/2 miles.
- Day 19: could fully kneel and spread legs.
- Day 20: stopped using Aleve; first night of staying in bed without a bathroom visit.
- Day 24: walked 3 miles.
- Day 27: started physical therapy to deal with pre-surgery range-of-motion problems.
- Day 30: stopped using Ted stockings and stopped taking aspirin for blood-thinning.
- Day 37: regained full internal heat-generating capacity (tended to get chilled before).
- Day 39: walked 4-1/2 miles during day and went dancing that night.
- Day 42: carried 5 wheelbarrow loads of firewood up stairs.
- Day 45: had 6-week follow-up visit with Dr. Mast; cleared to return to sports.

Return to an Active Lifestyle

I am writing this story about 2-1/2 months after my surgery. My hip and surgery-related pains are long gone. Various other leg pains associated with regaining range-of-motion come and go, depending on level and type of physical activity, but I am continuing to improve week-by-week. I have been given a second chance at a very active physical lifestyle, and I am eternally grateful to Dr. Mast and medical advances in hip replacement for this incredible opportunity.

This is not to say that I am currently or ever will be completely out of the woods. There are now higher risks of infection, dislocation, and joint failure than with natural hip joints, and the artificial joints may eventually wear out and need replacement. And of course the rest of my body is continuing to age, so this is in no way a fountain of youth. What it is, however, is a re-adjustment of the rate of aging of various parts of my body so that my body can continue to function as a whole. Through continuing to be physically active, I can stay healthier, enjoy life more, and live longer.

I look at my hip replacement as one of life's adventures. I learned a lot about the medical world in the process, and experienced a powerful rejuvenation in faith in humanity due to the high-quality care I received from Dr. Mast, his surgical team, and the hospital medical staff, and from the compassionate response of all of my friends and acquaintances at home after surgery. I wouldn't wish hip replacement on anyone, but if you need it done, find a good surgeon like Dr. Mast and give yourself the opportunity to make the most out of the rest of your life.