1976

ORATOR: Verner S. Johnson, MD

Chief of Orthopedics, The Memorial Hospital; Associate Professor, Orthopedic Surgery. University of Massachusetts Medical School

ORATION: Hip, Hip, HOORAY!

I am flattered to be elected as your orator of 1976. I am pleased to be used as an excuse for so many of you to share a night of camaraderie and fellowship.

I suppose it is by no coincidence that I was offered a drink by seven or eight of you tonight. I have long heard that the Irish invented the whiskey to keep the Swedes out of politics, but I never suspected it might be used to try to keep me off the rostrum.

I am particularly pleased, as I look among you, to see my first (chief of Surgery at The Memorial Hospital, Dr. Bancroft Cheever Wheeler. I am not sure exactly how long Dr. Wheeler has been around but it must be for some time for many of his friends affectionately call him "B.C." It has also been said that when Alexander Graham Bell made his first telephone call to Worcester he said, "Can you hear me, Bancroft?" Dr. Wheeler and I have shared many laughs through the years and he knows that I love and respect him.

One of the perplexing problems for an orator, speaking to a forum of such divergent interests and specialties, is just what to talk about.

I posed this question to our Vice-president, Dr. Leroy Mayo, and he said, "Oh, about fifteen minutes."

I then asked our President, Dr. Philip Butler, and he suggested something unique, yet of general interest.

For several weeks, I recollected my infancy, boyhood, and adultery. I have done many unique things in my. life but they are mostly not of general interest.

However, after deep speculation, I recalled a unique interest I had in my pre-med days as a zoology major. I had always been intrigued by the hump on the Arabian camel's back and researched that out quite thoroughly. My conclusions were that there was a direct relationship between the dorsal kyphosis of the Dromedary camel and his sexual habits. I thought this subject would at least keep the psychiatrists awake during this meeting.

However, my enthusiasm was short lived. I discussed my potential thesis with our immediate past president, Dr. Edward Kilroy. He felt that the subject was indeed unique but that it was of such general and common knowledge that it would not go over. The subject was then dropped.

I then went to a potential orator for advice, Dr. Stuart Jaffee, a urologist. He suggested "stick to your orthopedic specialty and trace something of historical or immediate interest in that specialty." I built on that advice.

As a sidelight, quite frankly, Dr.Jaffee is already contemplating an oration. He is dying to discuss (with colored slides yet) the present status of the new selastic-type semi-rigid internal prosthesis of the corpus cavernosa. He feels this would not only be unique but of general interest to a large segment of the medical society who are realizing their built-in obsolescence. My gut feeling, after talking with Stu, is that he will volunteer such an oration when the procedure can be done in the office or on a house call. He thinks it not good judgement to have his colleagues' names listed on the printed hospital operative schedule.

As I am sure you have guessed from the title, I am going to speak on what you need to know about hip surgery and were afraid to ask. In my series of slides, I would like to trace the logical evolution and history of hip surgery, particularly over the last 50 years. In going over my slides last night, I realized the presentation was about twice as long as it should be. Hence, for the sake of brevity, I will only talk about the right hip.

For those of you who do not deal closely with anatomy, at least on a professional basis, the preliminary slides are for orientation and to awaken members in the dark corners of the room.

As this Playboy model shows, the right hip joint is where the thigh bone hitches to the pelvic bone and the pelvic bone hitches to the back bone, etc. The untanned area, the area of the missing bikini, is the general area of the hip joint. As you know, anatomy is something everyone has but somehow it looks much better on women.

Seriously, if I leave no other message with you tonight, I want to clear up why "Aunt Helga" was able to get off her walker in three months and has done just fine while "Mrs. Patient" had all sorts of trouble with her hip and required more surgery

The basic reason and answer is, of course, anatomical; but this is not generally known by the public.

Essentially, there are two types of fractures of the hip and they are like night and day with regard to prognosis.

The intertrochanteric fracture or the fracture away from the head of the femur, has an extremely good blood supply and usually heals quickly and satisfactorily almost without regard to treatment. There is nourishment to that fracture on both sides of the fracture line and this will heal with internal fixation, traction, or as they did in the older days, "hanging with a rope wrapped around the ankle to gain length." This would be an excellent fracture to specialize in.

On the other hand, the notorious subcapital fracture has been the bugaboo of the Orthopedic Surgeon for decades and the bone setter for centuries. It is a fracture that occurs at the femoral neck or next to the head of the femur. This fracture is pretty much like cutting off the end of a cucumber that is furthest away from the nutrient stem and expecting the distal portion to grow back on. The prognosis depends directly on how large the vascular and bony disruption. Unfortunately, even at this date, there is no good way to measure this vascular insult or the prognosis. Essentially what the orthopedic surgeon has to do, is to correct the bony displacement, fixate the fragments in an acceptable position, and then sit back and wait. Even in the best of hands, even with the best possible devices, probably 40% of the subcapital fractures will not heal.

Although Dr. Andre Nicoloyson inserted a hand-hewn metallic screw into a fractured hip in 1897, it remained for Dr. Marius Smith-Petersen at Massachusetts General Hospital to conceive a clever fixation device; you all know it as the SmithPetersen nail. Although he published his article on this 35 years ago, he obviously was doing work in the late 1920's. The original nail was actually made out of flat cold roll steel and soldered together in a tri-flange manner and topped off with brass cap.

Although this was a clever and mechanically strong fixation device, the various component metals set up an electrolysis process when bathed in the body fluids and hence caused chemical reactive change and deteriorated. This led to stainless steel nails that have been used effectively since.

In fact, the tri-flange nail has served as a basic idea for much of the apparatus made since that time; many modifications have been made.

One of the most interesting modifications to the nail was made by Dr. Sven Johanson from Sweden in 1937. He suggested to Smith-Petersen that a cannulated hole in the central portion of the nail would make it easier for x-ray visualization of a guide pin and also serve as a slide for the nail. Smith-Petersen, being a stubborn Norwegian, had difficulty accepting this suggestion or criticism from a Swede, and never was enthusiastic about this change. It is interesting to note that Johanson patented the hole in the nail and thereafter collected royalties on each cannulated nail made. This was done with much criticism from the pillar of orthopedic surgery, Sir Reginald Watson Jones, of England.

From a mechanical point of view, the screw as used by Nicolayson, would still have been an excellent apparatus had the shank of the screw been smooth to allow for impaction of the femoral head with healing. This is one of the virtues of the Smith-Petersen nail.

The principle of the screw device was used by Archimedes two centuries before Christ. As you know, from your pre-med physics, the screw is but a spiral incline plane and is a "simple machine" in that it is a machine driven by only one force. It consists essentially of an incline plane that is wrapped around a cylinder or cone. As such, much like a wedge, it exerts a tremendous force and this is the reason for its lasting and effective use as a holding device. The same application is still used daily in the orthopedic armamentarium in the form of various nuts, bolts, and various types of screws. A good example are the Knowles pins, now most frequently used for subcapital fractures.

As can be seen in the photograph, following the discovery of the SmithPetersen nail, a whole evolution of apparatus developed. Side plates were attached to the nail by McLaughlin and used for the intertrochanteric fracture. However, there was an inherent weakness that the apparatus sometimes fell apart. Jewett and others developed a solid apparatus for the intertrochanteric fracture. Many other modifications were then made. Such as the Ken collapsing nail, which allows impaction of the subcapital fracture and still has the stability of the side plate.

It should be mentioned that one of the pioneers in hip nailing was Dr. John O'Meara of Worcester. In the New England Journal of Medicine in 1935, four years after Smith-Petersen's article on hip nailing in the Archives of Surgery, he described a method of "blind pinning of the hip." He used no guide pin or x-ray control.

Soon after World War II, Smith-Petersen had the occasion to remove a piece of glass from the deep subcutaneous tissues of a patient. On doing so, he noted a synovial-like fluid in the encapsulated pocket that enclosed the glass. He had long been searching for a method of covering the arthritic and avascular heads of femurs. He conceived the idea of making a glass cap to put over the head and into the acetabulum of the hip joint. This led to the use of glass molds in 1923. These, however, broke and were replaced by unsuccessful Viscaloid cups two years later. In 1933, Pyrex had been invented and were tried. These also fatigued and fractured as did Bakelike cups in 1937. It was not until 1938, after talking to his dentist that he hit upon the idea of using Vitalium, a very inert but extremely strong metal that is used for dental fixation. Shortly thereafter, he developed the Vitalium cup, subsequently, particularly through the efforts of his successor, another surgical genius, Dr. Otto Aufranc, the Vitalium mold arthroplasty was developed. It was the forerunner of most subsequent hip devices. As you have seen from the slides, this device is so inert and so strong that some molds have been recovered unscathed after thirty years of wear. Over 3,000 mold arthroplasties have been done by Dr. Aufranc. His excellent results have been duplicated but by a few. Having been his resident, indeed seeing is believing. I personally feel that the mold arthroplasty still remains the proven treatment of choice

in younger people for arthritis of the hip.

Following the invention of the cup by Smith-Pete, as he was affectionately called, a whole circus of devices developed. Judet in France combined a Smith-Petersen cup with a Smith-Pctersen nail and stuck it through the neck of the femur. Obviously, this was mechanically poor and it fractured and dislodged. Some were made of nylon causing further problems of breakage and allergic reactions.

It remained for Austin-Moore and F.R. Thompson to develop a "solid cup with a stem" so that the weight bearing force could be directed down the inner shaft and along the calcar of the femur. Since then, a whole myriad of prostheses have developed (see photograph).

We are presently at the stage of the "total hip." This consists of a prosthesis with a smaller head that engages into a false acetabulum made of high density, low friction plastic. These components are essentially cemented to the femur and the gouged-out acetabulum. Further refinements undoubtedly will be made but we have to hooray about with regard to the present status of hip surgery. So far the results are incredibly good.

Thank you.

ADDENDUM: In answer to Dr. Kilroy's apology that he squelched my tentative oration on The Relationship of the Dorsal Kyphosis of the Dromedary camel and the camel's sexual habits and in answer to his request that I give a short conclusion, I offer the following:

The sexual life of the camel is stranger than anyone thinks,
For on the moonlit nights on the desert,
He tried to make love to the sphinx.
But the sphinx's posterior channels are filled with the sharp sands of the Nile,
And that is what gives the hump to the camel's back,
And the sphinx's inscrutable smile!

Author Unknown