PATIENT NEWSLETTER

Joint Implant Surgery and Research Foundation

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TWO PATIENTS WHO ARE INVOLVED

Before there was a JISRF Patient Newsletter or a **Patient's Guide To Total Hip Replacement,** junior high school teacher Dean Helmick of Fresno, California thought there should be and singlehandedly attacked the problem. Working entirely on his own and armed only with a deep conviction that more people needed to know about the miracle of Total Hip Replacement, the soft-spoken educator set out to do what he knew best by teaching others what he had learned. He prepared, printed and distributed a paper based upon his own losing struggle with crippling degenerative arthritis and his return to a healthy, active life after having had both hips replaced in June of 1972.

The paper, designed for other potential implant recipients, described the operation and helped to prepare the hip patient for the postoperative treatment and precautions which follow. The finished product, which also included a great deal of personal research into the causes and effects of his condition, was distributed to friends, acquaintances and relatives in his one-man campaign to let others know that something could be done about the problems of severe joint disease.

Helmick, who first learned of the total hip replacement in a **TIME** article which he read in 1970, is back at work today, free from the constant pain and restricted motion which had drastically affected his ability to work or carry on even limited activities prior to the surgery. His current activities for the JISRF include using his newly regained mobility to distribute Foundation literature and promote a wider public interest in the potential of joint implant surgery.

Dean Helmick

Ozzie Glover

The pain and restrictions of the joint disease victim were certainly not news to Ozzie Glover, Los Angeles film producer and cameraman. For over forty years prior to his hip replacement in February of this year, Mr. Glover had lived with a hip which had been totally immobile since it was fused in an operation performed at the age of eleven.

Drawing upon his wealth of experience making film documentaries, Ozzie was busy in the operating room soon after his first visit to Dr. Charles O. Bechtol, filming several particularly difficult hip replacements for inclusion in JISRF's Motion Picture Lecture Series. These films are now available to surgeons and hospitals everywhere and play an important role in our medical education programs.

Mr. Glover, just back from Siberia where he filmed a documentary on walruses, finds that using muscles which have been dormant for forty years takes some getting used to but he reports that they are getting stronger every day. In addition to his already crowded schedule, his determination to help others is capped by his volunteer work as a listener on a crisis hotline.

FOUNDATION MAIL

Each week we receive many letters from total hip patients and from people with joint problems who want to know more about the hip or other replacements. While we consider it a vital part of our function to provide this information and to answer each inquiry with a personal letter and appropriate literature, some of our mail falls into a category which we are unable to effectively deal with.

These letters usually come from persons affected with the pain and motion limitation normally associated with joint diseases or injury. Often they will include medical histories and recount what they have been told by various doctors. Most end by asking whether or not we think they need a joint replacement.

Whenever this happens our reply must be the same: only your own doctor, after examining you personally and consulting your x-rays and anyone else who may be treating you, can answer this question. We advise these people to consult an orthopedic surgeon in their own city. If they do not already have one, we recommend that they ask their family physician or local medical society to refer them to an orthopedic surgeon.

We have received and answered enough such letters lately to make us feel that this statement of our position should be made. We want to hear from you and to help by providing clear, accurate information whenever it is needed. We can't, however, diagnose your condition on the basis of a letter.

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DIRECTOR'S NOTE

Since the publication of our last Patient Newsletter there has been a great deal of activity and more than a few major changes here at JISRF Headquarters. For starters, we have just moved into new and larger offices and added another full-time staff member as a part of our program to increase communications and services in both the lay and medical sectors. Our enlarged facility includes motion picture and photographic capabilities which are already an integral part of our expanded teaching and research efforts.

Concurrent with these changes is the return to semi-retirement of J. C. de Graaf who has served tirelessly as Managing Director of the JISRF since it was founded nearly two years ago. Mr. de Graaf will continue on as the organizer and director of Foundation surgical courses and I will replace him in the capacity of Managing Director.

My background prior to acceptance of this position has been in medical communications, primarily in orthopedics. As a medical writer and film maker I have been deeply involved with the total hip and other joint replacements almost since their introduction into this country. It is my hope that this knowledge and experience will help to further JISRF's already remarkable achievements in the area of joint implant surgery.

I would like to extend my personal invitation for you to visit me here at Foundation Headquarters for a first hand look at our activities and I earnestly solicit your full support in our continuing effort to expand our knowledge in the many still uncharted areas of crippling joint disease.

F. Michael O'Rourke
Managing Director

UNDERSTANDING TOTAL JOINT REPLACEMENT

This is the second in a series of articles designed to inform Newsletter readers on various aspects of joint replacement and the attendant research which has brought it to its current place. The first such article described the goal of total hip replacement.

The Development of Total Joint Implants

Most of us having any contact whatsoever with the subject of total joint replacement have heard and repeated many times how the total hip was developed and proved in England. This medical and scientific "happening" led to further research and discoveries and must ultimately be regarded as one of the major milestones of modern medicine. It has, in fact, been called the single most important medical event of the century. While there are certainly many who would argue with this statement, the event takes on added dimension when we consider the fact that here, for the first time in human history, a diseased body system can be objectively evaluated, classed as unfit for further service and be completely and totally replaced by a manufactured device which, for all practical purposes, closely approaches the original in function, freedom of maintenance and durability. Looking at it this way, the "event of the century" seems closer to an appropriate description of the total hip.

But where did the total hip and all of the other total joint implants which are springing up after it come from? How did they come to be? Most of us can summon up a hazy vision of white-coated technicians bending over microscopes in a gleaming research center somewhere. After that point we are pretty much in the dark. In fact, it would be a pretty safe bet to say that most of us haven't the foggiest notion of what all of those people are looking for with their microscopes.

The long, expensive and laborious process which has as its end result a hip or knee implant being surgically installed into a patient is not easy to relate without the danger of gross oversimplification. So, in view of our limited space, let's pick up the new implant at the stage in its development where all of the existing data on the joint has been gathered and all of the new research has been added to that. A doctor or a team of doctors has reviewed it all and theorizes that a mechanical device meeting certain specifications could reasonably be expected to perform the function of a damaged joint in the human body.

The next step is the creation of a prototype or sample of the device. The idea, perhaps accompanied by some models or early prototypes, is presented to a surgical equipment manufacturer for evaluation and refinement. The manufacturer has at his disposal engineering and research and development facilities. Additionally, he has a great deal of practical experience and specialized knowledge in the production of medical devices. His engineering staff knows what new materials are available or under development. His managers know what other groups are working in the same area and what they are doing. His technicians can handcraft prototypes for testing. As a part of his relationship with the medical profession, the

manufacturer is continuously updating his knowledge in these areas.

The idea and all pertinent data are turned over to the engineers for investigation. It is their job to apply what they know about materials, design and manufacturing to the production of a plan by which the sample will be made. They may discover during this process that the implant will not work for some reason or that it would work better if the design were different. Ultimately, their work is referred to the doctor with a review of their findings and recommendations as to how the sample will be made. With his assent, their plan becomes a prototype in the research and development shop. This is the first in a long series of practical tests for the design. Everything to this point has been on paper.

With the delivery of samples made with approved materials known to possess the desired characteristics of strength and tissue tolerance, serious testing of the new implant can begin. At this stage also, the development of the specialized instruments required to install the new device is begun. This preliminary testing is carried out in the laboratory and consists of tests in actual anatomical specimens and mechanical evaluations which help to determine the strength characteristics of the design and materials.

Depending upon the results of early prototype testing, design modifications are made and a second generation of prototypes is developed, as are samples of specialized instrumentation needed for the operation. These are subjected to further anatomical testing and, finally, to very limited testing in carefully selected patients. Generally, the patients in whom these first implants are used are those for whom no other satisfactory means of treatment has been found. Since the nature of the implant materials is thoroughly known and since the characteristics of the new device have been very minutely studied, the earliest recipients are well guarded against extreme hazards. Keep in mind the fact that these people are selected only after other means of treatment have failed or been judged unsatisfactory for them. The experimental nature of the new implant is, of course, explained in detail as are the possible consequences or side effects of the operation. Acceptance is completely voluntary.

After the installation of numerous prototypes, the results and progress of the patients involved are carefully studied and gathered for presentation to other interested doctors, usually in a paper presented before a medical meeting or published in a journal.

The acceptance of the concept of the new implant within the medical community leads other groups to try it and to further report their results. Ultimately, if the device proves successful, it comes into widespread use and the number and type of patients to whom it is applied spreads. Conversely, poor results in even a relatively small percentage of patients either stops use of the implant or sends it back to the drawing board for serious reconsideration and repetition of the early testing procedure.

At some point in the development of the successful joint replacement, a consensus is reached wherein the manufacturer agrees to commit his resources to regular production of the implant and the instrumentation needed to install it. This decision is generally made as the result of a great many doctors having become interested in the new replacement operation and wishing to make it available to their patients. In deciding to produce the equipment, the manufacturer must allocate a great deal of money for tooling, revised production schedules and the like to the new device. Having made this decision, he can then begin to fill the demand for it and a supply of implants and instruments becomes available to surgeons and hospitals nationally.

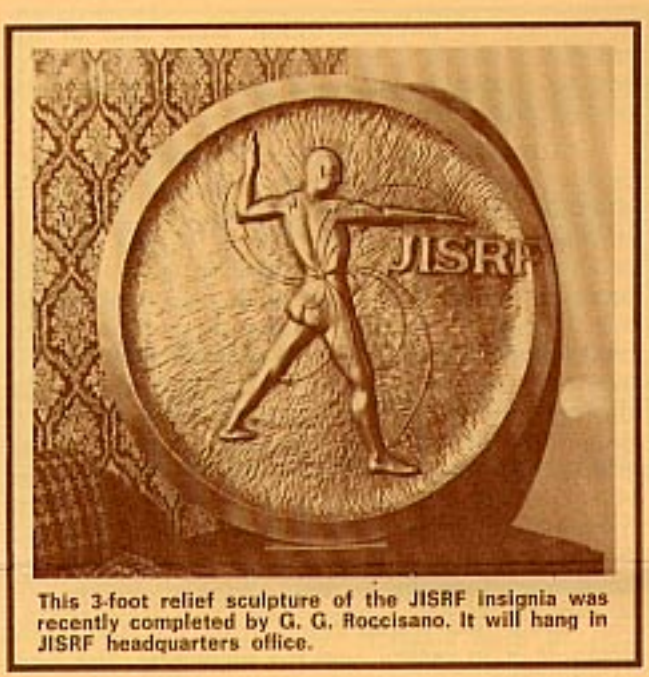
While this would seem to be the end of the story, it is, in reality, just the beginning. The availability of the new implant system and its use by a large number of doctors promotes increasing commentary, applications and knowledge based upon a large number of cases. Design modifications are suggested, new instruments are developed, the availability of the device in different sizes is expanded and the number and kind of situations in which the replacement can be used are broadened. Based on the knowledge gained from practical experience with many patients, more papers are written and totally new devices come into being.

The time span during which the successful new joint replacement remains new is unpredictable. If it is really successful, other manufacturers will begin to produce their own versions. These will contain added improvements and features and the original will have to be modified to keep pace with them. The process will continue with succeeding generations of implants based upon the original until all of the possibilities for improvement have been exhausted. And while all of this is happening, other researchers elsewhere are planning an even more sophisticated system which will someday do the job even better because it will be based upon everything that has already been learned.

MORE ON THE TOTAL KNEE

In an earlier issue of the Newsletter we described the then current status of the total knee replacement which was still in its early stages of patient testing. Now, a year after that report, we are able to tell you that development of the total knee replacement is progressing very well and that the knee operation is on its way to becoming widely available for several debilitating and painful conditions.

(Continued on Page 4)



This 3-foot relief sculpture of the JISRF insignia was recently completed by G. G. Roccisano. It will hang in JISRF headquarters office.

One of the problems that was recognized early in the work that was being done on the knee was the fact that no single design could meet the requirements of all patients. While it is generally possible to apply a basic implant to a great many problems in the hip, the natural anatomy of the knee required the development of three different kinds of joint implant replacements to meet all of the requirements of the varying diseases and injuries normally encountered.

The need for three different total knees is brought about by the natural anatomy of the joint, which relies upon a combination of ligaments and cartilage for its function. The cartilage is located in two compartments—one on either side of the joint—formed by the ends of the two long bones of the leg. These glide upon one another in the healthy joint to permit smooth motion. If, as a result of arthritis or some other eroding disease condition, the cartilage is destroyed, the joint becomes painful and will not function properly. In these cases the smooth cartilage must be replaced. If only one side or compartment of the joint is damaged, it must be replaced and any bowing or knock-knee caused by the wearing down of the cartilage on that side corrected. If, on the other hand, both sides or compartments are eroded, the complete joint surface must be replaced and this requires a second type of device or a combination of two single sided devices for correction.

The other aspect of the knee, ligaments, calls for a third type of total joint replacement. The ligaments in a normal knee give the joint its stability by holding the two long bones together. Often the ligaments are destroyed and, when this is the case, mere resurfacing of the cartilage is not sufficient. Such situations require an implant that is hinged together in some manner so that the new joint will have stability as well as motion.

Implants of each of the three types needed are now in use on an increasing scale and further refinements and development are continuing with these as a base.

JUST A REMINDER . . .

We wish to remind you that JISRF still has metal detector identification cards available to your physician for you, the metal implant recipient. If you have a metal implant of any type and your doctor has not given you one, ask him to do so. These cards are a great help when passing through electronic metal detection equipment at airports. Incidentally, anyone going to the airplane boarding area must now pass through such a device. You don't have to be boarding a plane to need a card.

Other items designed especially for hip implant patients such as our sterling silver hip implant replica and our **Patient's Guide to Total Hip Replacement,** a most informative brochure, are also available here at the Foundation.

JISRF PROGRESS REPORT

Research, education and service; these are the key words in describing JISRF's 1973 activities. Our research efforts are progressing with active projects in three major areas related directly to joint implant surgery. Active projects are pointing the way to improved infection controls, reduction of postoperative complications and better implant designs.

During the past year our methods and techniques of total hip replacement have been taught to hundreds of doctors and surgical nursing personnel across the country. The publication of technical papers and distribution of JISRF-produced teaching films have brought this valuable information to thousands of other involved medical professionals.

JISRF services to patients, doctors and others with an interest in total joint replacement have made available informative newsletters, vital patient information and such helpful items as the Metal Detector Card.

There has been much to do and each task completed uncovers the need to do more. Requests for more extensive patient information programs, greatly expanded research activities and more films and instructive literature fill our mail box. Increasing numbers of medical institutions and doctors are requesting information. Our plans for the future include filling as many of those requests as our budget will allow. Among our top priorities are the publication of more patient-directed literature, initiation of a planned implant design study and development of more comprehensive information on the knee.