The Registered Nurse
Surgical Assistant

By Laura R. Dale, Joanne Bos and Sherry Espin

Introduction

In 1981, The Toronto Western Hospital introduced the first Surgical Assistant position. This position evolved as a result of the reduced numbers of surgical residents, the need for consistency in patient care and the expansion of the cardiac program. The purpose of this article is to provide an overview of the Surgical Assistant position at The Toronto Hospital.

This position requires commitment, the need to be conscientious and organized as every day can bring new challenges, both expected and unexpected. The rewards come from patients through their expression of appreciation and their recovery.

How The Position Evolved at the Toronto Hospital

At our institution the first Registered Nurse Surgical Assistant began her career on a Surgical Unit in 1977, where she worked for one year. She then transferred to the Cardiology/Cardiovascular Unit and worked there for two years. From there she participated in an eighteen month operating room practicum.

Abstract

This article provides a candid account of the evolution of two Registered Nurse Surgical Assistant positions, and their roles as members of a large open-heart team. A description of the expectations of the job, the role in surgery and the challenges and rewards are outlined.

In 1981, during a cardiac rotation she was approached by a cardiac surgeon as to her interest in becoming a Surgical Assistant, then titled a Physician Assistant. The surgeon explained that her job would involve harvesting the great saphenous vein and assisting during heart operations. She felt honored and excited to have the opportunity to embark upon this new expanded role. However, it was not until 1983 that Nursing Administration approved the position.

As a Physician Assistant she would start her day with cardiac team rounds. The cardiac team would see all postoperative patients to assess for: cardiac function (including auscultation of heart and chest, examination of legs for edema and reviewing cardiac ECG rhythms), indications for infection, incision healing, coping with recovery and ambulation. The opportunity for teaching was provided as patient concerns were addressed. She participated in patient discharge planning and assisted in the writing of discharge letters. The Physician Assistant would then go to the operating room where she worked with the two cardiac surgeons, harvesting the great saphenous vein, closing the wound in the leg and then second assisting at the chest.

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Learning how to harvest the great saphenous vein was through demonstration and gradual practical application. Training began with assisting the resident or staff surgeon with harvesting the vein. She began to suture the patient's leg wound and progressed to complete closure. She then started to take the great saphenous vein with assistance. With experience her ability to assess and apply the knowledge and skills learned eventually allowed her to independently perform the saphenectomy.

Research Involvement

The Physician Assistant was also taught how to enter patient information into a data base computer program for quality assurance and research purposes. This data was analysed and presented monthly at Morbidity and Mortality rounds. In July of 1990 the Cardiovascular Division merged and relocated. This involved an increase from two to five cardiac operating rooms. The move did not come without its difficulties for all of those involved. The Physician Assistant was confronted with uncertainty of a new environment and staff. In performing the job with care, and demonstrating her abilities as an expert gained her acceptance and respect.

In 1984, the Physician Assistant began participating in research with a cardiac surgeon. In the research laboratory she organized the equipment and supplies (instruments, drapes, video equipment, echocardiography, etc.) and assisted as the scrub nurse. An experimental heart valve was examined, perfected and trialed successfully in an animal model for six months. In 1991, this heart valve developed in the research laboratory was granted Investigational Device Exemption (IDE) for a five year clinical trial. The Physician Assistant became the Patient Coordinator of this study. In 1996 this heart valve was approved for use in Canada.

In 1994, the Division of Cardiovascular Surgery recruited a second Registered Nurse to be trained as a Physician Assistant. Not realizing that such an opportunity was even a career possibility, she accepted the job with excitement. Following the first Physician Assistant, her mentor, brought much variety and possibilities for learning. In the operating room she was taught by the first Physician Assistant how to harvest the great saphenous vein(g.s.v.). In the research laboratory she learned to organize and assist in a research study. Additionally, research related tasks were taught both by her mentor and the cardiac surgeons.

Duties and Responsibilities

In 1995, the title Surgical Assistant was established. This title was changed to differentiate the roles of the assistants within the operating room and the cardiac units (a position held by Nurse Clinicians).

A typical day as a Surgical Assistant is often not so typical. Starting at seven in the morning the day begins with postoperative patient rounds conducted by the physicians and clinical assistants and/or the day begins with reviewing charts for patients involved in research studies. Once a week teaching rounds occur to discuss patients and to have presentations from a guest speaker. At eight o'clock, with coffee in hand, the past and the present day's events are reviewed by the Surgical Assistants. Then to the operating room where the first procedure begins (**see Table 1**).

Tasks required during the operation depend on the scheduled procedure. As one of two assistants for the surgeon, the Surgical Assistant helps to make the operation progress smoothly by organizing the field, suctioning, retracting and cauterizing. For an aortocoronary bypass the great saphenous vein is harvested.

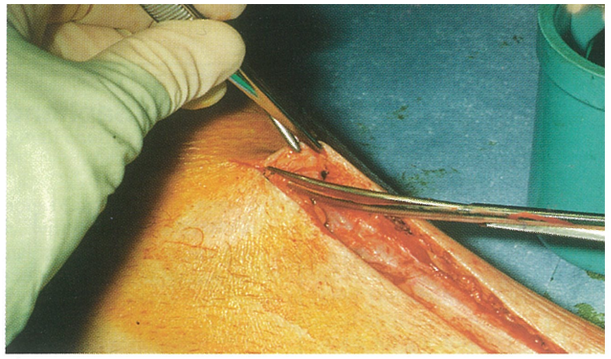
Harvesting the great saphenous vein begins with landmarking its most common occurring site. The vein is usually harvested from the left leg because of positioning of the surgical team.

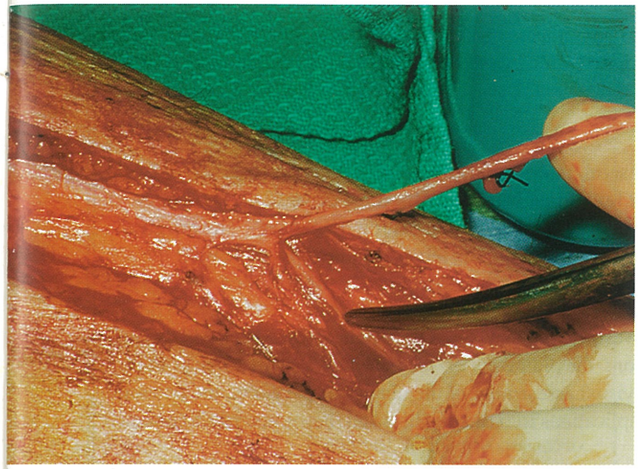
Before harvesting begins the surgeon indicates the length of conduit required for the coronary artery bypass graph (CABG). The epidermis, dermis, fat and facia anterior to the vein is cut. As the incision is made the bleeding sites are cauterized to allow for optimal vision and to decrease blood loss. Once the required length of vein is visualized then the saphenectomy begins. Harvesting the vein involves: dissecting the tissue surrounding it, ligating of the venous branches using a 3-0 silk tie on the proximal end and a 5 millimetre titanium steel clip on the distal end and cutting in between. This procedure is continued along the entire length of the vein. Once the length of the great saphenous vein is released from the tissue it is ligated with a 0-0 silk or 2-0 dexon tie and cut at the proximal and distal ends. The vein is marked for identification and then it is removed. The vein is then dilated with a Ringer's lactate solution. Dilating the vein assists in assessing the vein's quality and to see any additional branches that may need to be tied. The vein is kept moist until it is utilized in a Ringer's lactate solution on the scrub nurses table. The leg is then sutured closed. The Surgical Assistant (S.A.), also assists with retraction of the heart while the distal

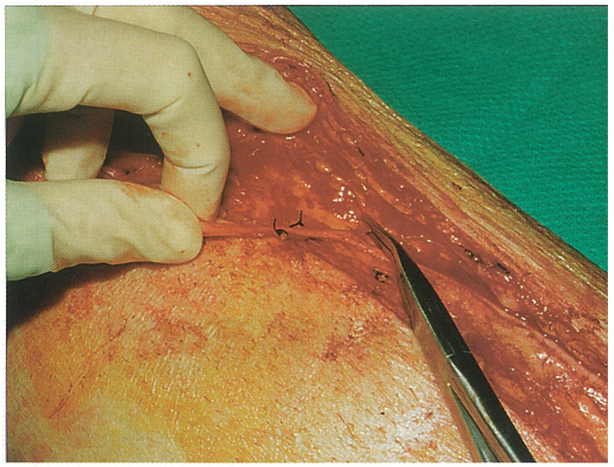
Table 1
OPERATING ROOM
Preparing Patient for Operation

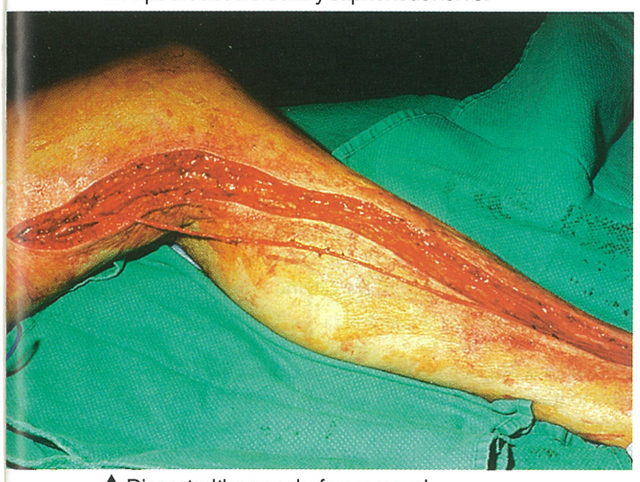
Procedure	Purpose	Description
View angiogram	To familiarize self with condition of patients (pt.) vessels and heart preoperatively, and potential length of vein to be harvested	With frequent viewing of angiogram the Surgical Assistant becomes more familiar with the irregularities and differences in patients vessels
Retrieve pt. x-rays Display x-rays on viewer	For surgeon to review	Surgeon can see the location of irregularities of the heart (size, position, aneurysms, etc.) pertinent to the procedure
Review patient chart	Familiarize self with pt. history and potential complications	Areas that may be of concern, eg. previous "vein stripping", vascular problems, prostrate problems, redo surgery, diabetes
Insert urethral foley catheter	To empty bladder and to calculate output To assess kidney functioning intraoperatively	Sterile insertion of foley. Use of a urojet (freezing) with difficult catheterization and contact doctor or urology if need for dilators - which are retrieved and set up for the doctor
Position patient on operating room table	Pt. is positioned as close as possible to the surgeon Position may vary with operation	Having the patient close to the surgeon decreases back straining Patient supine, arms secured at patient's sides, legs in stirrups for prepping
Prep. patient	To decrease the microbial count of the skin	Betadine scrub from - chin to ankles, bedside to bedside then dried with sterile towels. Repeat above with betadine solution
Draping	To create a sterile field	Assist with draping; feet wrapped, legs set on top of drapes, leg not used for saphenectomy covered with a sterile towel

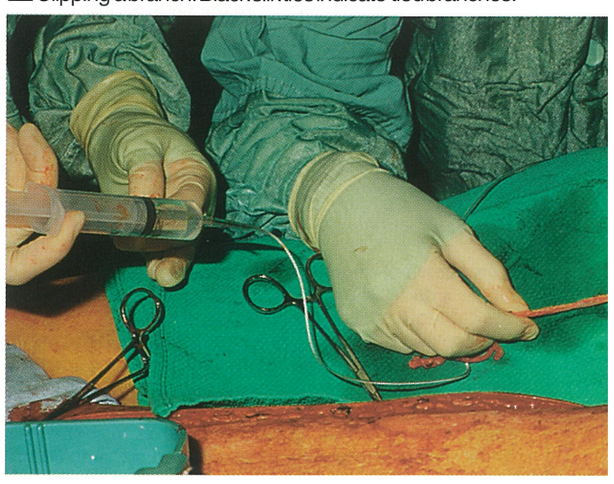

▲ Prepping the patient

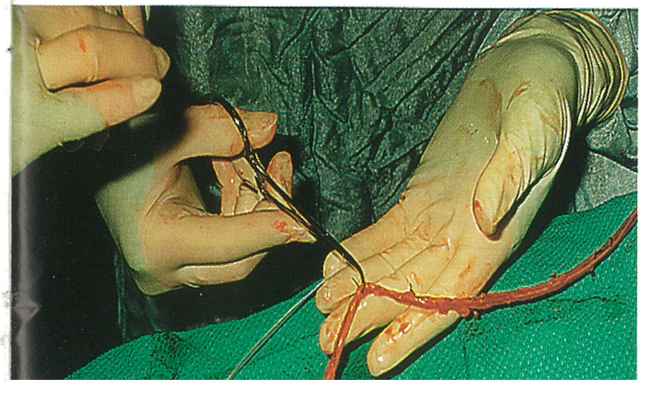

▲ Cutting Tissue Superior to Vein

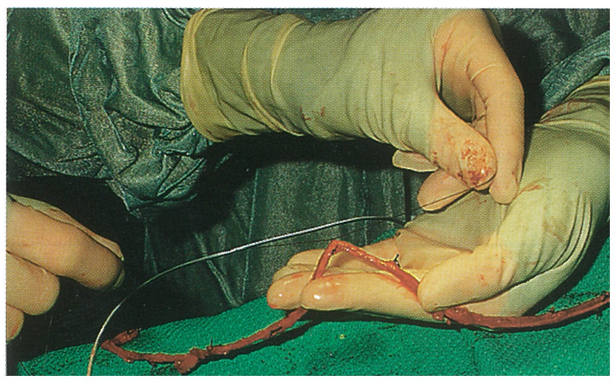

▲ Tips of scissors identify saphenous nerve.


▲ Clipping a branch. Black silk ties indicate tied branches.


▲ Dissected the g.s.v. before removal.
▼ Clamping a banch of the g.s.v. for tieing


▲ Dilation of vein. ▼ While setting first knot, clamp is removed and additional knots are thrown.





Saphenectomy - Table 2

Procedure	Purpose	Description
Choice of leg via visual exam, history and physical	Determining which leg to use for saphenectomy	Determining factors may include previous injury, poor circulation or ulcers. In addition, if the vein has varicosities, has been stripped or used for a previous bypass operation
Position leg for g.s.v. harvesting	Facilitate harvesting of the g.s.v.	Bend leg at the knee and externally rotate at the hip
Position leg for lessor saphenous vein harvesting (when required)	To increase exposure and thus ease in harvesting the lessor saphenous vein	Bend both knees together and rotate the hip of the operative leg internally. (The lessor saphenous vein is utilized when the g.s.v. is not present or is not appropriate)
Position of the surgical team	To allow for optimal working conditions	The scrub nurse stands diagonally from the surgeon **Left leg** - Most commonly used leg because of the teams positioning and ease in harvesting **Right leg** - The Surgical Assistant stands on the left side of the OR table until the vein is harvested, then moves to the right side
Incision location	Choice of g.v.s. harvesting site	Harvesting the g.s.v. from the thigh, ankle or both is dependent on: the diameters of the coronary arteries to be grafted, the visual assessment of the quality of the g.s.v., the potential complications in tissue healing and the surgeon's choice
Landmark vein	Landmarking superior to the vein avoids unnecessary trauma to the tissue and allows for optimal vision of the g.s.v.	**Thigh** - The g.s.v. branches from the femoral vein and lies on the internal aspect of the thigh. It sits medially to the vastus medialis muscle, posterior to the fascia, within the adductor canal. **Ankle** - The g.s.v. lies anterior to the tibial malleolus and continues up the medial side of the leg in relation to the saphenous nerve
Initial incision	To expose the vein	With a 22 blade a 5-10 cm incision along the direction of the vein is made perpendicular to the skin. If the vein deviates from its anatomical position a forcep and a Metzenbaum scissor are used to separate the tissue and locate the g.s.v. Dissection is continued through the fat and fascia where the g.s.v. is exposed
Exposure of the great saphenous vein	To remain superior to the g.s.v.	A 22 blade or a Mayo scissor is used to extend the skin incision to its desired length. Dissecting of the fat and fascia superior to the vein is continued for 10 to 15 cm segments following the veins path until the desired length is obtained. Often it is necessary to use the self retaining retractor to assist in retracting excess tissue. Following the g.s.v. in this organized manner allows the Surgical Assistant to see the path that the vein is taking. This process avoids unnecessary tissue flaps and it maximizes exposure of the vein
Dissection of the great saphenous vein	To remove the vein required for the bypass surgery	The tissue surrounding the g.s.v. is retracted with a forcep and is cut using a Metzenbaum scissor. Once the vein is exposed for a 1-2 cm circumferential area gentle digital retraction of the vein is begun. The S.A. avoids cutting too close to the vein to prevent damaging the adventitia layer and cutting unvisualized venous branches
Ligation of vessels	Increase exposure,decrease blood loss and to prevent postoperative haematoma	As the g.s.v. is dissected small vessels are encountered. Some are small enough to be cauterized. Larger vessels are clipped
To release the g.s.v. from the leg	To obtain a conduit for bypass grafting	Venous branches are clipped at least 5mm distal from the g.s.v. with a medium, 5mm, titanium hemoclip. The venous branch is tied at a distance from the g.s.v. as to prevent a stricture or bulge in the g.s.v. This establishes a symmetrical conduit and decreases turbulence of flow. The branch is then cut medially. This procedure is continued until the required length of vein is obtained
Preserving the saphenous nerve	To decrease postoperative leg paresthesia and pain	Below the knee the saphenous nerve lies anteriorly and superiorly to the g.s.v. Cutting the tissue surrounding the vein can be challenging, as there is little tissue between the vein and the nerve. Gentle retraction is used to avoid trauma to the nerve. Occasionally the saphenous nerve is sacrificed in order to preserve the g.s.v.
Ligation of the g.s.v.	To remove the g.s.v. for the CABG	The proximal end of the g.s.v. is clamped with a right angle clamp and cut. The distal end of the g.s.v. is clamped with a mosquito clamp and cut
Marking the end of the g.s.v.	To identify the proximal and distal ends of the g.s.v.	Upon removal of the g.s.v. the proximal and distal ends are immediately identified. The surgeons' preference determines the method. The proximal end of the vein is sutured to the coronary artery and the distal end is sutured to the aorta, thus creating an arterial conduit
Dilation of the g.s.v.	To assess the quality of the conduit, to release spasm, to flush and to identify any branches that are not tied or that need to be retied	Using a pediatric feeding tube or the irrigation cannula and a 10cc syringe filled with lactated ringer's. The vein is set onto a dry sterile towel - thus making it easier to identify any leaks in the vein. The Surgical Assistant inserts 5 cm of the feeding tube into the distal end of the g.s.v. and dilates the vein while occluding the flow in l0cm segments
Ligating the proximal & distal ends of the g.s.v. in the patient	To prevent bleeding	The ends are tied with a heavy silk or a 2-0 absorbable synthetic suture This occludes the blood flow and thus the Surgical Assistant can remove the Right angle and Mosquito clamps that were applied before removing the g.s.v.
Cauterizing	Preparing for leg closure To acomplish haemostatis	Any bleeding vessels are cauterized or clipped with a medium hemoclip to avoid haematoma formation in the leg wound
Leg closure - Subcutaneous	To approximate wound to allow for healing, to decrease skin tension and infection	The leg is assessed for the incision's depth, to determine the number of subcutaneous layers to be closed. With a 2-0 absorbable synthetic suture the layers are closed. Special attention is given to closing the dead space to prevent haematoma formation and approximating the same subcutaneous layers on both sides of the incision
Leg closure - Skin	To approximate wound thus allowing for wound healing	Four methods of skin closure can be used dependent on the patient's condition or the surgeon's choice: **Staples** - a fast method, but the skin edges must be precisely approximated to prevent dehiscence. A 3-0 cutting **absorbable synthetic suture** into the subcutaneous layer. **Steri-strips** - when the skin edges are completely approximated. A **running mattress suture** technique using a nonabsorbable monofilament suture on a straight needle. This technique is used in situations when the leg wound needs more support or the skin is friable
Dressing	To decrease the risks of infection and to absorb any discharge from the incision	A sterile dressing is applied to the leg wound prior to removing the drapes

anastomosis is performed (**see Table 2**). After the leg is closed the Surgical Assistant changes her gloves and assists the surgeon at the chest.

Research Responsibilities

As Patient Coordinator the Surgical Assistant preoperatively obtains an informed consent for the patient to participate in a clinical trial, orders bloodwork and an echocardiogram. The patient is seen by the Surgical Assistant at three months and on the anniversary date of their surgery for a five year period. Follow-up visits involve, assessing the patient for complications and addressing the problems by notifying appropriate medical staff, answering any questions and reinforce patient teaching as required, taking a venous sample and having an echocardiogram. Research forms are completed at each patient visit to inform the sponsoring company of the patient's progress, and to monitor cardiac and non cardiac related complications.

As an assistant to research, patient charts are reviewed and telephone follow ups are made. Patients are assessed as to their condition (i.e. quality of life, pain, reocurrence of disease, need for medication and complications). Based on the collaboration of data an assessment is made and if necessary a plan is established with the patient as to an appropriate intervention.

Realities

As a Surgical Assistant each week comes with variety. A typical week consists of spending three or four days in the operating room assisting the cardiac surgeon. The other days are spent in the office working on research related activities: this involves seeing and/or telephoning patients, collecting patient data, updating computer entries and contacting research sponsors. This time is also spent reviewing the patients' chart for the following week to complete an initial assessment of the patients' history and cardiac function.

The need to be flexible and adaptable is important, for example one can start a day expecting to scrub in on a case but then discover that research data needs to be collected or refined. Alternatively, one may arrive at work to find that the planned day in the office is changed because of operating room requirements. A procedure may take longer than expected, thus one needs to adapt quickly. During lunch hours and/or at the end of the day, telephone messages are answered, in hospital patients are seen and/or their charts are reviewed.

Flexibility is essential as needs of the day vary. Self motivation and commitment are vital. Some days can be long and stressful, and work that one wants to accomplish accumulates requiring overtime hours to catch up. Alternatively, some days can be less demanding allowing one flexibility of working hours.

The rewards of the job are obtained through a feeling of fulfilment that one was apart of the team that assisted in the patient's treatment and hence the improvement in their quality of life. Patients often express gratitude for 'the opportunity to live a new life'. Rewards are also received through the expression and demonstration of appreciation from the surgical team.

As part of the institution's commitment to research and teaching the Surgical Assistant is encouraged to attend in-house seminars and local meetings/conferences. The Cardiovascular Division sponsors the Surgical Assistant to attend an annual conference, and courses in epidemiology, statistics and computer use.

Future Direction

As the healthcare system becomes more efficient, expectations on health care workers increase. Academic government funding has limited the number of medical resident positions within The Toronto Hospital and thus the numbers of assistants within the operating rooms has decreased. These positions need to be filled by qualified staff.

The role of Surgical Assistant in the United States has been in existence for many years. Training programs are approved by the Committee on Allied Health Education and Accreditation of the American Medical Association and students are certified through an examination. In 1981 as an education organization, the Association of Physician Assistants in Cardiovascular Surgery (APACVS) was begun.

At The Toronto Hospital this expanded role is possible because of the support and encouragement received from all members of the health care team. To fulfil the need for the Surgical Assistant and other Advance Practice roles, nurses' knowledge and abilities are being recognized and utilized to their maximum benefit.

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