The Role of Local Muscle Flaps in the Prevention of Groin Vascular Wound Complications

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By

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Abstract

BACKGROUND:
To report the use of the sartorius muscle in the preemptive coverage of vascular bypass grafts in selected patients with high risk groins.

PATIENTS AND METHODS:
Ten males were identified. The sartorius was turned over 180 degrees to cover the vascular conduit at the end of the procedure (Dacron in eight groins and composite in two groins).

RESULTS:
All muscle flaps were viable. No vascular graft infection occurred despite groin complications (skin necrosis, wound dehiscence and infection) in more than half of the groins. No amputation was necessary. Four mortalities were encountered with causes not attributable to graft sepsis. Mean follow up was 9.1 month's (range: 0.5-18 months).

CONCLUSION:
Further study with a control group and longer follow-up is necessary to closely examine the role of the technique in preemptive control of graft sepsis in selected patients with high risk groins.

TYPE OF STUDY:
Case series.

KEY WORDS

Sartorius - Vascular graft infection - High risk groin - Prevention of

infection - Turnover myoplasty - Vascular surgical site infection(VSSI).

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Dedication

To...

My father (God bless him) who is always showing me the right way in this life..

My mother who is always teaching me the meaning of love to people..

My sister and brother for their endless great support..

My professors who opened their treasures of experience and knowledge to me..

Dr. Usama Saeed.. My God Father.. Many Thanks..

Everyone who helped me even by a word from his heart..

Everyone who made an effort to make this work complete.. with appreciation..

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Introduction

INTRODUCTION

Infection in a peripheral vascular prosthesis continues to be a serious complication in arterial reconstructive surgery and threatens the patient with loss of either limb or life. Infection rates at major centers are now low, ranging from 1% to 6%. However limb loss and mortality rates for this complication range from 4% to 75% depending on the location of the graft and the extent of the infection.

(Meland et al., 1994 and Pinocy et al., 2003).

The complexity of variables associated with vascular surgical site infections (VSSI) often contribute adversely to reinfection, limb salvage, and mortality rates. ***(Armstrong et al., 2007).***

The use of muscle flaps in the management of acute wounds, infection prone-wounds, exposed orthopedic hardware, and osteomyelitis is now commonplace. Transposed muscle has been shown to be well-vascularized tissue that improves healing time and decreases local wound bacterial counts. ***(Meland et al., 1994).***

Several reliable flaps can be used for coverage of groin vascular anastomosis e.g.: sartorious flap, rectus abdominus flap, rectus femoris flap, omental flap and tensor fascia lata flap.

(Hill et al., 1978, Nahai et al., 1978 and Nahai et al., 1979).

AIM OF THIS WORK:

To evaluate the incidence of vascular surgical site infection in patients undergoing groin vascular reconstructive surgery and preemptive coverage of the reconstructed vessels with local muscle flaps and compare these figures with the literature.

STUDY DESIGN:

Ten patients undergoing groin vascular reconstructive surgery for ischaemia will be subjected to coverage of the reconstructed vessels with local muscle flaps at the time of the initial procedure. The patients will be assessed regarding the incidence, type, and extent of groin wound complications (e.g., infection, wound dehiscence, exposure of the graft and pseudoaneurysm) in a postoperative period of three month's. The figures will be compared with studies implementing traditional layered closure of the groin wound in patients undergoing vascular reconstructive surgery.

Review of literature

Anatomy of the groin

Anatomic nomenclature of the Groin :

Source of misunderstanding of groin anatomy is the common misuse of anatomic nomenclature. The misrepresentation of structures within the groin by instructors and students alike prevents both proper identification of critical landmarks and proper repair. The most common error occurs when individuals confuse the term ***aponeurosis*** as being synonymous with ***fascia***. An aponeurosis is a flat fibrous sheet that connects a muscle to a fixed point. It is composed of strong connective tissue and therefore possesses good internal strength. This anatomic structure is not synonymous with a fascia. A fascia is a condensation of connective tissue into a definable homogeneous layer within the body. Unlike an aponeurosis, a fascia possesses little internal strength. Another example of this misrepresentation involves the components of the transversus abdominis complex within the abdominal wall. The transversus abdominis muscle is the deepest of the three flat muscles of the lateral abdominal wall. The transversus abdominis aponeurosis is the flat tendenous insertion of the transversus abdominis muscle. Finally, the transversus abdominis fascia is the investing layer of the transversus abdominis muscle or a thickening of the endopelvic fascia.

(*Bendavid ,2001*).

Pelvic skeleton :

To understand the laminar tissue layers of the groin, a surgeon first should possess a basic understanding of the pelvis. The structure is composed of the iliac bones, pubic bones, ischial bones, and sacrum, thus

forming a complete circle and providing a conduit between the torso and lower extremities. The 2 anatomic landmarks most commonly used are the anterior superior iliac spine and the pubic tubercle. These 2 anatomic landmarks allow identification of the only groin anatomic structure that is consistent from one patient to another: ***(Watson,1924).***

This anterior angulation aligns the anterior superior iliac spine and pubic tubercle in a vertical plane. Therefore, when standing in anatomic position, the anterior tilt of the pelvis results in the anterior abdominal muscles forming a sling within the groin, (figure 1). Thus, the pelvis not only serves as the foundation but also shapes the architecture of the groin anatomy. ***(Fagan and Awad,2004).***

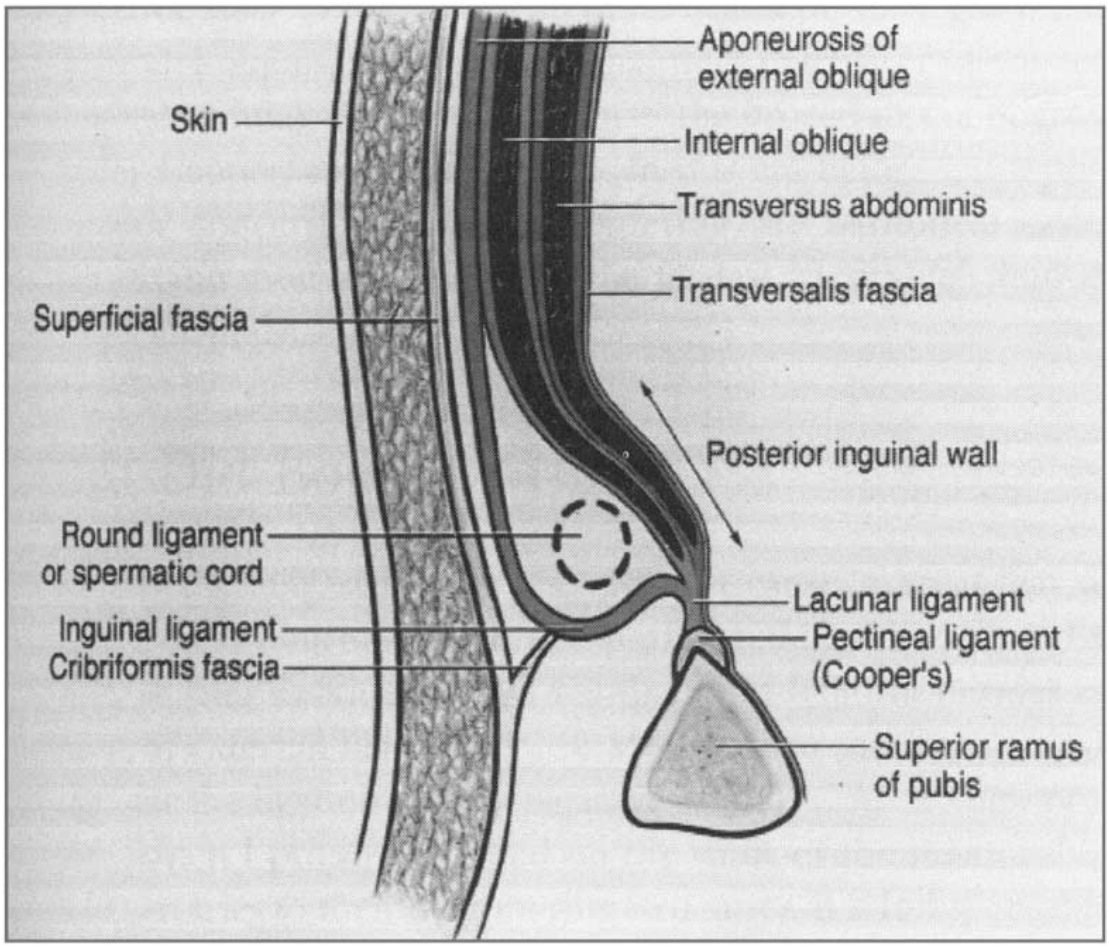

Fig.(1) Anatomy of the groin (lateral view) (Fagan and Awad,2004).

Tissue layers of the groin :

The layers of the abdominal wall function together as a solitary unit to prevent herniation through the myopectineal orifice. Structurally, the first anatomic layer that influences groin herniation is the Scarpa fascia, because the skin and subcutaneous tissues within the groin provide little support to the underlying myopectineal orifice. The Scarpa fascia is a dense homogeneous membranous sheet of areolar tissue that forms a definable lamina within the subcutaneous tissue. It attaches inferiorly to the linea alba, the dorsum of the penis, the anterior thigh, and the iliac crest. Sometimes mistaken for the external oblique aponeurosis in the elderly, this layer can be identified by applying simple traction to the layer of interest. If the skin moves with the application of traction, the layer is the Scarpa fascia. In contradiction, application of traction on the external oblique aponeurosis should cause no skin movement because of lack of connection between the 2 anatomic layers. ***(Condon,1989).***

Groin region :

The groin or inguinal region denotes the area adjoining the junctional crease between the front of the thigh and the lower part of the anterior abdominal wall, and includes the inguinal and femoral canals. (figure 2).

(Fagan and Awad,2004).

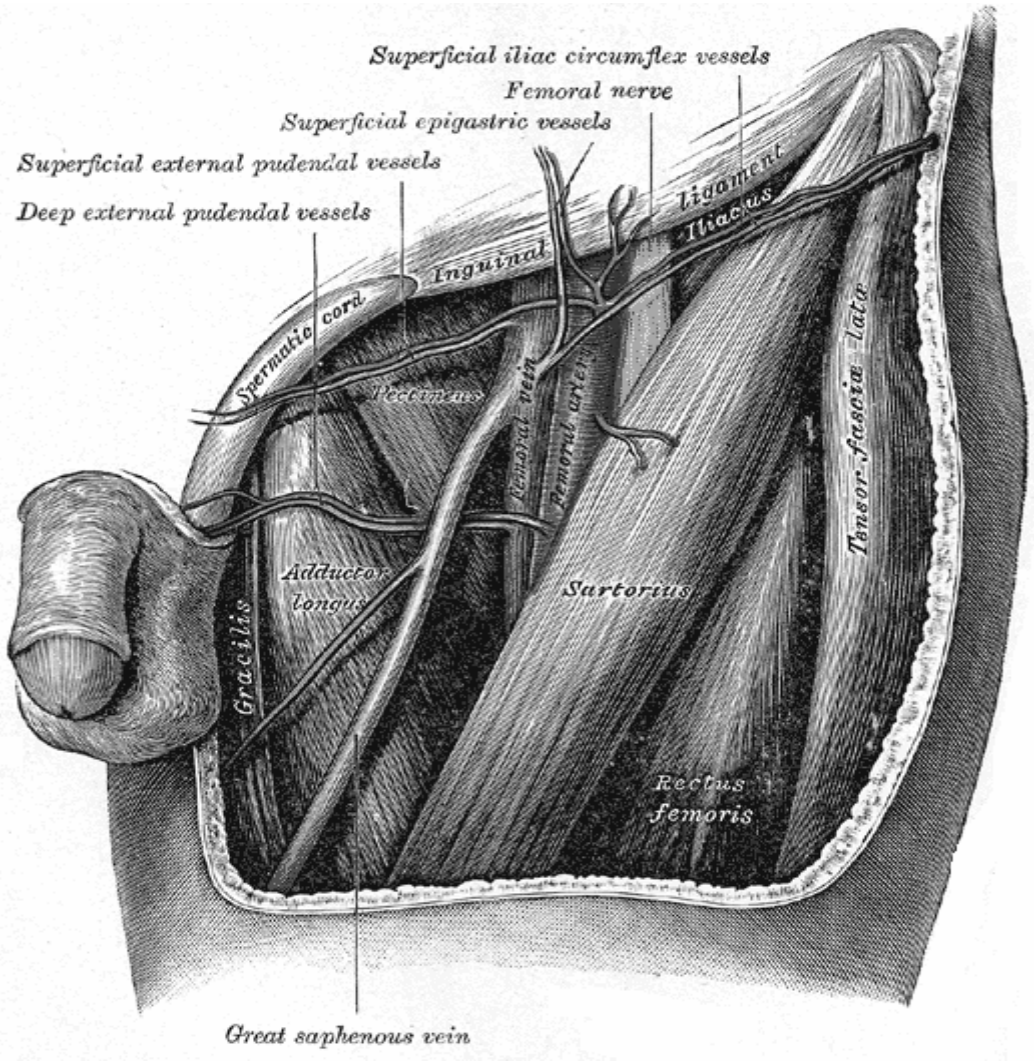

Fig.(2) Anatomy of the groin (anterior view)-Gray's Anatomy page 549

Anatomy of muscles used for Groin Coverage

Several reliable flaps can be used for groin wound coverage e.g.: sartorious flap, rectus femoris flap, rectus abdominus flap, omental flap, gracilis muscle and tensor fascia lata flap. ***(Hill et al., 1978, Nahai et al., 1978 and Nahai et al., 1979).***