The International Society for the Study of Vulvovaginal Disease Surgical Oncological Procedure Definitions Committee "Surgical Terminology for Vulvar Cancer Treatment"

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Objectives: The International Society for the Study of Vulvovaginal Disease (ISSVD) Surgical Oncological Procedure Definitions Committee propose a consistent terminology based on well-defined and reproducible anatomic landmarks that can be used by all who are involved in care of patients with vulvar conditions.

Materials and Methods: The fundamental principles behind the new terminology contained descriptions of the area extension and depth of the surgical procedure.

Results: Vulvar Surgical Topographic Anatomy Landmarks

Extension. The *internal border* of the vulva is the *hymenal ring.* The *genitocrural folds* are the external lateral borders.

The vertical line through the clitoris and the anus defines *lateral* portions of the vulva.

The horizontal line from the upper border of the hymenal ring defines *anterior* and *posterior* portion of the vulva.

Depth. The floor of the vulva is represented by the *median perineal fascia* or *perineal membrane* of the *urogenital diaphragm.*

A. Vulvectomy

1. Extension: partial/total vulvectomy. Removal of part/entire vulvar/perineal integument independent of the depth.

2. Depth: superficial/deep. Removal of the most superficial layer/removal of the vulvar tissue to the superficial aponeurosis of the urogenital diaphragm and/or pubic periosteum.

B. Inguinofemoral lymphadenectomy

1. Superficial inguinofemoral lymphadenectomy. Removal of the nodes located beside the inguinal ligament and along the great saphenous vein.

2. Deep femoral lymphadenectomy. Removal of the nodes below the cribriform lamina and medial to the femoral vein.

Conclusions: This terminology helps avoid confusion and promote better understanding and exchange of experiences among gynecologic oncologists involved in vulvar carcinoma care.

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BACKGROUND

The primary goal of the International Society for the Study of Vulvovaginal Disease (ISSVD), founded in 1970 by a multinational group of gynecologists, dermatologists, and pathologists, was to define and promulgate an international nomenclature (terminology) for vulvar diseases.

These efforts have gone a long way toward recognizing that in the last 20 to 30 years, more specialties (female pelvic medicine and reconstructive surgery, oncology, psychology, physical therapy, family medicine, etc.) have been involved in the management of vulvar diseases. There is a clear need for an ongoing dialog between representatives of the different disciplines in an attempt to arrive at a universal terminology for diagnostic and therapeutic procedures that is accepted, consistently interpreted, and understandable.[1] This has been partially accomplished, and the society currently has in place recently revised terminology and classifications for vulvar dermatoses,[2] vulvar dermatological disorders,[3] vulvar squamous intraepithelial lesions,[4] and persistent vulvar pain and vulvodynia.[5] In this article, we explain the deficiencies of the previous vulvar surgical descriptors and propose a consistent terminology based on well-defined and reproducible anatomic landmarks that can be used by all who are involved in care of patients with vulvar conditions.

THE HISTORY OF SURGICAL TERMINOLOGY FOR VULVAR CANCER

For a long time in gynecologic surgery, we have used the terms *simple vulvectomy and radical vulvectomy,* with every surgeon having its own full understanding of the procedure. However, the definition may vary from one physician to another and may lead to problems when treatment outcomes are compared. At the Eighth World Congress of the ISSVD in Aland, Finland, in 1985, a task force was appointed to propose a new surgical procedure terminology to provide more precise definitions. The terminology was discussed and approved by the ISSVD at the Tenth World Congress, in Washington, District of Columbia, in 1989 and published in 1990.[6]

The fundamental principles behind the new terminology contained descriptions of the area (extension) and depth of the surgical procedure. It was recommended that these 2 terms be used to describe the operation.

A. Vulvectomy

1. *Extension*

1.1 *Partial vulvectomy.* Removal of part of the vulvar/perineal integument independent of the depth.
1.2 Total Vulvectomy. Removal of the entire vulva and appropriate integument of the perineum independent of the depth.

2. *Depth*
2.1 *Superficial.* Removal of the most superficial layer with a variable amount of dermis and subcutaneous tissue.
2.2 Deep. Removal of the vulva to the superficial aponeurosis of the urogenital diaphragm and/or pubic periosteum.

B. Vaginectomy (the information in this section is omitted since it is not relevant to this current terminology.)

C. Inguinofemoral lymphadenectomy

Superficial inguinofemoral lymphadenectomy.
The superficial inguinal/femoral lymph nodes are located beside the inguinal ligament and around the upper part of the great saphenous vein and its branches. All of the nodes are located superficially and are close to the fascia. Some of the superficial lymph nodes may lie along the course of the round ligament. Thus, *superficial inguinofemoral lymphadenectomy* means removal of the lymph nodes described above.

Deep Femoral Lymphadenectomy

The deep femoral lymph nodes are all located in the subfascial space between or along the femoral vessels. The uppermost of these deep nodes are located high up in the femoral channel posteromedial to the femoral vein. *Deep femoral lymphadenectomy* is removal of the lymph nodes below the cribriform lamina and medial to the femoral vein.

According to this terminology, *radical vulvectomy* was called *deep total vulvectomy*, and *wide local excision* was called *partial vulvectomy, superficial or deep.* Removal of the anterior part of the vulva together with the clitoris was a *deep partial vulvectomy.*

A total or partial vulvectomy can be superficial or deep, and removal of all the lymph nodes in the groin can be superficial or deep inguinofemoral lymphadenectomy.

This 1989 document showed that the "conservative and individualized surgical oncologic philosophy," developing between the late 1970s and early 1980s, had been taken into account by the ISSVD.[6]

This new surgical philosophy questioned the standard application of the "en block radical vulvectomy and bilateral dissection of the inguinal-femoral and pelvic lymph nodes," described by Taussig[7] and Way,[8] which represented the standard surgical approach to any primary vulvar lesion, regardless of its site or size. The transition to this less mutilating surgery reflected the increased surgical knowledge gained during that time.[9]

However, this more conservative and individualized surgical approach to invasive vulvar cancer has led to the development of various surgical procedures indicated by different terms, which create confusion and contradictions.

The "Surgical-Procedure Terminology for the Vulva and Vagina" approved in 1989 and published in 1990[6] was updated in 2009 by the "ISSVD Vulvar Surgical Terminology Committee" consisting of Leonardo Micheletti (chairman) (Italy) and members, Olle Frankman (Finland), Ronald Jones (New Zealand), Rainer Kurzl (Germany), Allan MacLean (United Kingdom), Mario Preti (Italy), and Roman Rouzier (France).

A preliminary draft was available, but it was never officially discussed by the ISSVD.

Their original recommendations have been developed and integrated with newly acquired knowledge by the current SURGICAL ONCOLOGICAL PROCEDURE DEFINITIONS COMMITTEE "Surgical Terminology For Vulvar Cancer Treatment," presented by Mario Preti in 2017 during the XXIV ISSVD World Congress, in Mendoza. Argentina.

COMMITTEE OBJECTIVES

The aim of the current committee is to create an acceptable and easy terminology that can be used for the treatment of vulvar malignancies based on universally known anatomic terms and on objectively identifiable surgical anatomic landmarks.

Terms such as lateral, central, posterior, and anterior, often used in the literature, are confusing. A clear anatomical point, identifying where the locations "lateral, central, posterior, and anterior" start, is lacking. Similarly, surgical terms as sector/partial, skinning/superficial, simple, radical/deep vulvectomy, or wide excision are not clearly defined. There is no consensus even in the recently published international "treatment guidelines" on these terms.[10–14]

In nodal surgery, terms such as selective node sampling, sentinel node biopsy, and radical/total lymphadenectomy need to be better defined.

APPROACH

A surgical terminology should be supported by clear definition and acceptance of notions related to topographic anatomy and specific to surgical practice. However, through a critical review of the classic, chiefly used Italian, French, German, and English textbooks of anatomy, it has already been reported that there is a lack of uniformity in descriptions of the fascial structures and the lymph nodes of the vulvar and inguinal region.[15]

Some landmarks of topographic anatomy that indicate the extension and depth of the vulvar and groin areas are described hereinafter.

This particular anatomical approach should help better define the various conservative and individualized surgical procedures and favor a surgical terminology based on correct anatomical knowledge.

In this surgical terminology, we did not take into account the ontogenetic theory of cancer fields resection,[16] as exploring new surgical approaches is beyond the aim of this article.

Vulvar Surgical Topographic Anatomy Landmarks

Extension. The *internal border* of the vulva is universally and objectively identifiable in the *hymenal ring.* There is consensus in recognizing the *genitocrural folds* as the external lateral borders (see Figure 1, vertical dotted line). In addition, the *interlabial folds* (see Figure 1, vertical broken lines) represent an anatomic landmark, easily found even in presence of lichen sclerosus or vulvar tumors. The interlabial folds identify and separate the central and lateral portions of the vulva. The central portion is included between the interlabial folds; the lateral portions are laterally to the interlabial folds. Because there is no current consensus on the definition of "laterality," we do not intentionally mention a metric measure from the midline (e.g., 1 or 2 cm) as anatomic landmarks can be easily identified in any vulvar region independently from its dimension.

The vertical line through the clitoris and the anus (see Figure 1, line A1) defines *lateral* sides of the vulva (right and left).

The anterior and posterior borders are vague and imprecise; it is generally reported that the vulva extends *anteriorly* to include the *mons pubis* and *posteriorly* to the *anus or perineum.*[17,18] However, the mons pubis belongs both to the lower central quadrant of the abdomen (hypogastrium) and to the anterior urogenital triangle.

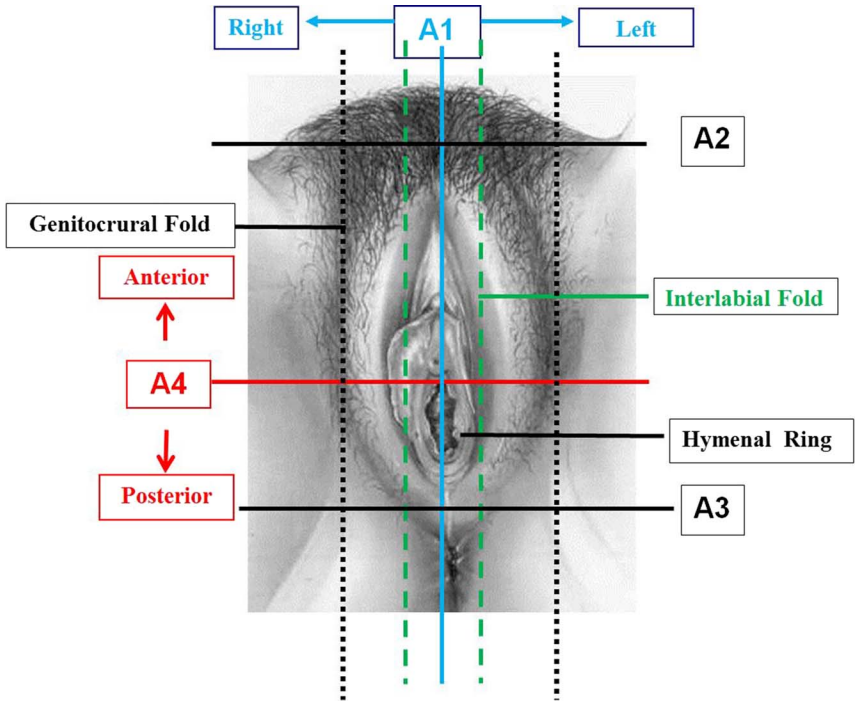

FIGURE 1. Surgical vulvar landmarks: extension. The vertical line (A1) through the clitoris and the anus defines lateral sides of the vulva (right and left). The horizontal line (A4) from the upper border of the hymenal ring defines anterior and posterior portion of the vulva. The anterior border (A2) of the vulva is identified in the superior margin of the symphysis. The posterior border (A3) is identified in the imaginary horizontal line dividing in half the perineal portion between the fourchette and the anterior anal margin.

Thus, the *anterior border* of the vulva could be better identified in the *superior margin of the symphysis* (see Figure 1, line A2).

The *posterior border* could be identified in the *imaginary horizontal line* dividing in half the perineal portion between the fourchette and the anterior anal margin (see Figure 1, line A3).

This identification of the posterior border of the vulva illustrates the individual size variations of the perineum due to height, weight, and age.

The horizontal line from the upper border of the hymenal ring defines *anterior* and *posterior* portion of the vulva (see Figure 1, line A4)

Depth. Moving from the surface, the vulva is superficially covered by the *skin,* consisting of a keratinized, stratified, squamous epithelium, or epidermis lying on the dermis, which becomes, at the level of the vestibule, a nonkeratinized mucous membrane epithelium (see Figure 2).

The floor of the vulva is represented by the *median perineal fascia* or *perineal membrane* of the *urogenital diaphragm,* which becomes the femoral fascia in the thigh. Between the skin and the median perineal fascia of the urogenital diaphragm is the *fatty tissue,* which is divided into a superficial (hypodermal) and deep portion by the *superficial fascia* or *Colle's fascia.*

This stratified anatomical knowledge is surgically relevant, because it permits identification of 3 progressive depths or planes, which are integral to the 3 major types of vulvar excision that will be addressed.

Groin Surgical Topographic Anatomy Landmarks

Most controversies are encountered concerning groin surgery,[19] and this is probably due to the fact that the macroscopic anatomic knowledge is nearly always taken for granted, copied from article to article and from book to book without being questioned, and rarely interpreted from a surgical point of view.[15] These controversies have been addressed by Borgno et al[20] and Micheletti et al[21,22] through original anatomic and embryological studies, whose findings, integrated with classic anatomical knowledge, are presented.

Extension. The term groin encompasses Scarpa's triangle also named femoral triangle (see Figure 3). The base of this triangle is the *inguinal ligament,* which extends from the *anterior superior iliac spine (ASIS)* to the *pubic tubercle.* The lateral side is the medial margin of the *sartorius muscle,* the medial side is the lateral margin of the *adductor longus muscle,* and its *apex* is the junction point of the sartorius and adductor longus muscles.

Depth. Moving from the surface, the *groin* is superficially covered by the *skin* (see Figure 4). The *fatty tissue* is divided by the *superficial or Camper's fascia* into a superficial or subcutaneous (hypodermal) portion (includes vessels but no lymph nodes) and into a deep portion. The superficial fascia in thin women may not always be surgically evident, but efforts should be made to find it to preserve it. The rationale for preserving the superficial fascia and the previously mentioned subcutaneous tissue is to avoid skin necrosis.

Included between the superficial fascia and the *femoral fascia* are *fatty tissue, vessels (superficial circumflex iliac vessels, superficial epigastric vessels, external pudendal vessels, great saphenous vein),* and *superficial inguinofemoral lymph nodes*.

The *fossa ovalis* or *saphenous opening* is an aperture in the femoral fascia allowing the passage of the *great saphenous vein* and other small vessels. In the context of the fossa ovalis, the *femoral artery* and *vein* are respectively situated laterally and medially. The superior, lateral, and inferior boundaries of the fossa ovalis are delineated by the *falciform ligament.* The fossa ovalis is covered by the *lamina cribrosa* (often called the cribriform

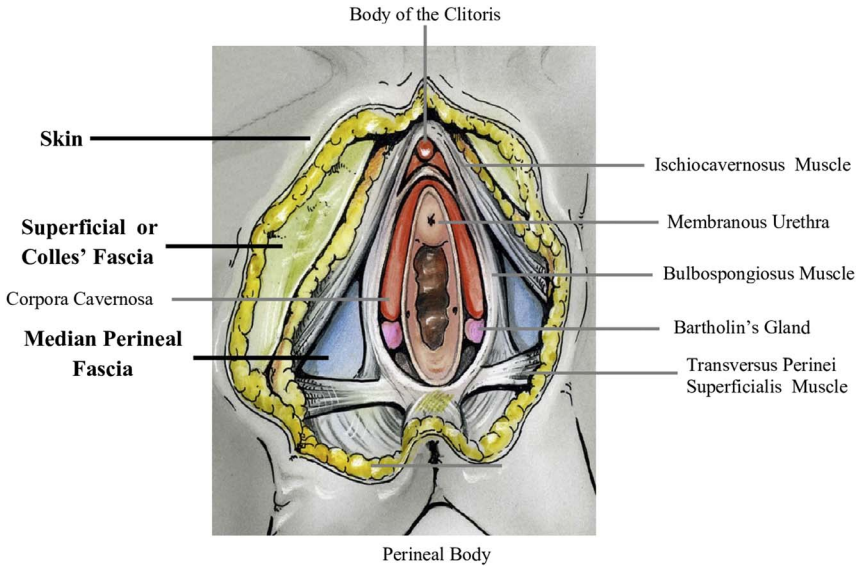

FIGURE 2. Surgical vulvar landmarks. Depth.

fascia), which should not be considered part of the femoral fascia but an independent structure resulting from the thickening of the connective tissue covering the fossa ovalis.[21] The surgical relevance of the fossa ovalis is related to the fact that the *deep femoral lymph nodes* are always situated within the fossa ovalis.

From a surgical point of view, it is important to know the exact distribution of the inguinofemoral lymph nodes in relation to the fascial structures. Actually, beyond the surgical terminological confusion present in the literature and reported by Levenback et al[19] at the end of the 1990s, some discrepancies still exist in atlases or manuals of pelvic anatomy and gynecologic surgery published from 2000 onward.[23–28]

The femoral fascia and the lamina cribrosa (coplanar structures) divide *the inguinofemoral lymph nodes* into *2 compartments, superficial and deep*.

The *superficial inguinofemoral lymph nodes* are divided into:

a) The *superficial inguinal lymph nodes,* or *superficial inguinal upper group lymph nodes* (see Figure 4), situated along the upper line of the inguinal ligament, superficially to the femoral and anterior abdominal wall fascia. The most lateral of these lymph nodes is situated medially or not far laterally to the superficial circumflex iliac vessels.[22,23]This anatomic-topographic knowledge is important because it modifies the classic surgical limit of lateral extension, represented by the ASIS, of the inguinal lymphadenectomy. Therefore, the superficial circumflex iliac vessels represent the best and easily detectable landmark at which the lateral surgical dissection along the inguinal ligament should stop. Leaving in situ the tissue between these vessels and the ASIS, devoid of lymph

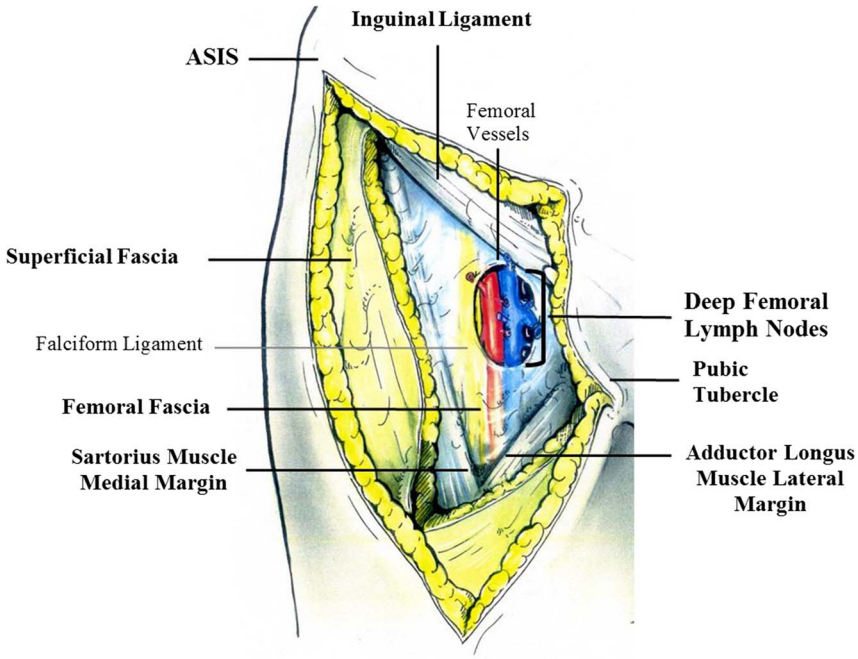

FIGURE 3. Borders, fascial structures, and deep femoral lymph nodes disposition in Scarpa's triangle.

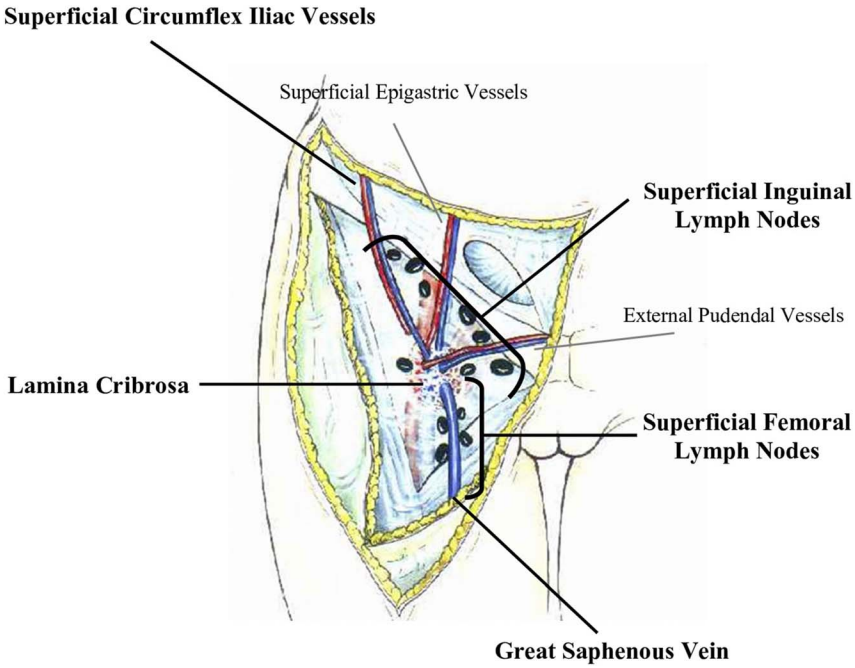

FIGURE 4. Topographic disposition of the superficial inguinofemoral lymph nodes and their relationship with vessels and fascial structures.

nodes but probably inhabited by some lymphatic channels, potentially decreasing the incidence of wound seroma and lymphedema.

b) The *superficial femoral lymph nodes,* also named *superficial inguinal lower group* or *superficial subinguinal lymph nodes* (see Figure 4), lie vertically along the terminal portion of the great saphenous vein before it enters the femoral vein, at the *fossa ovalis*, superficial to the femoral fascia.

The *deep inguinofemoral lymph nodes* (see Figure 3), are always situated within the *fossa ovalis*, beneath the level of the coplanar *lamina cribrosa* and femoral fascia, medial to the femoral vein. No lymph nodes are located beneath the femoral fascia distal to the lower margin of the *fossa ovalis* and lateral to the femoral artery.

Regarding the lymph node of Cloquet or Rosenmuller, it must be known that its presence has no particular surgical relevance and that today is considered an inconstant lymph node, being absent in approximately 50% of the cases and, when present, unilateral in approximately 30% of patients.[20]

SURGICAL ONCOLOGICAL PROCEDURE TERMINOLOGY FOR VULVAR CANCER TREATMENT

Recent discussion has resulted in the "Surgical Oncological Procedure Terminology for Vulvar Cancer Treatment."

Vulvar Surgical Terminology

The area (extension), depth of the surgical procedure, and status of margins are the fundamentals of this surgical terminology.

1. The *area* of the surgical procedures should be defined using the following terms:

A. Total vulvectomy. When the entire vulva is removed, the adjective "total," even if it is a synonym of vulvectomy, should always be used in conjunction with the term vulvectomy. This avoids misunderstanding with regard to the absolute amount of the vulva that is removed and permits better characterization of the meaning of "conservative vulvectomy" (see hereinafter).

B. Partial vulvectomy. When the excision is limited in extension to a portion of the vulva but is more than a biopsy.

Synonymous: sector or conservative vulvectomy, or vulvar sector excision or resection, or wide vulvar local excision.

The area of the surgical excision should be defined according to 2 lines that divide the vulva into 4 sectors (see Figure 1). A vertical line through the clitoris and the anus (A1) defines the *lateral* excision (right and left relative to the patient). A horizontal line from the upper border of the hymenal ring (A4) defines the *anterior* and *posterior* excision. The excisions included between the interlabial folds (see Figure 1, vertical broken line) are defined as *central*. The different excisions can be combined as a result of their extension (i.e., antero-posterior left partial excision or sector vulvectomy).

Define Conserved Areas. According to the well-established "conservative surgery philosophy" of describing vulvar surgery in oncology, it is useful to specify the areas spared. *Examples are as follows*: anterior sector vulvectomy with clitoral sparing; left anterior sector vulvectomy with labium majus sparing, etc.

Both total and conservative vulvectomy can be associated with distal urethrectomy and/or anorectal resection depending on the location or size of the lesion.

Term to be Avoided. *Hemivulvectomy* is an ambiguous definition, because it lacks a specific anatomic-topographic and surgical meaning.

1) The *depth* of the surgical procedures should be defined using the following terms:

A. *Skinning or superficial* (These terms should be intended as synonyms). Removal of a lesion with *only the skin/mucosa*, leaving in situ the underlying fatty tissue (hypodermal) and fascial structures (superficial or Colle's fascia).

B. *Simple*. Removal of the skin along with the *superficial* portion of the *fatty tissue* (hypodermal) lying on the *superficial fascia*. The term is not to be taken literally, as contrary to difficulty. In the United States as well as in some European countries, it describes the depth of tissue removed.
C. *Radical or deep*. Removal of the skin along with all of the tissue *extending from the surface* to the urogenital diaphragm or *median perineal fascia (perineal membrane).* From an anatomic point of view, the term "deep" is more descriptive, but from an oncologic point of view, the term "radical" has a well-accepted meaning of the complete correct surgical removal of a neoplastic lesion; it is also included in the insurance companies' terminology. Therefore, the term radical is preferred.

2) The *margin status* of the surgical procedures should be mentioned, given the reduction and contraction of tissues after excision and fixation, specifying:
A. The *presence of invasive lesion* at the resection margins (peripheral or deep)
B. The *distance* (measured in millimeter on fixed specimens) from the invasive lesion to the periphery and, when possible, deep resection margins.
C. The presence of *intraepithelial squamous lesions or chronic dermatoses* (lichen sclerosus, lichen planus) at the peripheral resection.

Groin Nodes Surgical Terminology

Inguinofemoral lymphadenectomy is the worldwide definition of the excision of groin or inguinofemoral lymph nodes. The procedure can be unilateral or bilateral, with or without the removal of an overlying skin flap and with (preferred) or without a separate incision.

1. *Selective sampling*. Dissection is performed only on clinically enlarged and suspicious lymph nodes.
2. *Sentinel lymph node biopsy.* A procedure involving the excision of the lymph node(s) marked by subdermal injection of a tracer (a radio-labeled and/or a dye tracer) into the tissue surrounding the primary tumor.
3. *Complete or total or radical groin lymphadenectomy or inguinofemoral lymphadenectomy (specify left/right unilateral or bilateral).* Dissection of the adipose tissue in Scarpa's triangle, containing all the inguinal-femoral lymph nodes. These include lymph nodes lying along the inguinal ligament and the saphenous vein (superficial inguinofemoral nodes) and those located within the *fossa ovalis* medial to the femoral vein (deep femoral nodes).

Terms to be Avoided. *Superficial groin lymphadenectomy* is an ambiguous definition, because it is not clear whether the dissection contains only the lymph nodes lying along the inguinal ligament or includes also the lymph nodes lying along the saphenous vein, known as "superficial femoral nodes" because they are located above the femoral fascia. According to the study of Stehman et al,[29] this surgical technique must be considered an incomplete groin lymphadenectomy, which greatly impairs survival and should not be used in the surgical treatment of invasive vulvar neoplasia.

Pelvic Nodes Surgical Terminology

It has been demonstrated that pelvic node radiation gives a superior result to pelvic node dissection in the presence of positive groin nodes.[30] Nevertheless, when no radiation treatment is available or when there is one or a few large pelvic nodes, a pelvic surgical approach may be needed. The following is the proposed terminology to be used in these cases.

Each of the following surgical procedures can be either unilateral or bilateral.

1. *Selective sampling*. A dissection performed only on lymph nodes that are enlarged and suspicious on an imaging study (computed tomography or magnetic resonance imaging). It must define the region of the sampling, for example, "common iliac" selective sampling.
2. *Pelvic lymphadenectomy.* A dissection that includes removal of all of the common and external iliac, the internal or hypogastric, and the obturator lymph nodes can be performed with open, laparoscopic, or minimal invasive surgery through the same skin inguinal incision.

CONCLUSIONS

The current "Surgical Terminology For Vulvar Cancer Treatment" is intended to be educational for those who are not familiar with vulvar surgical procedures and to assist surgeons dealing with vulvar surgery.

The advantages of this terminology are that the terms that we have used are accompanied by specific and identifiable anatomic-topographic landmarks on the vulva and the groin, including combining both extension and depth determinants.

Finally, this terminology should help avoid confusion and promote better understanding and exchange of experiences among gynecologic oncologists involved in vulvar carcinoma care.

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