The subcutaneous tissue, also called hypodermis, is composed of an extensive network of fatty lobule separated by thin fibrovascular septa. It helps with thermoregulation, provides an energy store, and serves as a cushion to protect internal organs. This mesodermic layer presents its own pathology and also may be affected by abnormalities that lie in the neighboring layers or structures. (Ebling et al., 1992).

Adipose tissue has been empirically assumed by surgeons to be composed of two layers of fat, its lobules divided by a membranous tissue layer. Its terminology varies according to atlases and textbooks, with the term fascia superficialis being the more frequently used. (Lancerotto et al., 2011)
Superficial Adipose Tissue (SAT) formed by fatty lobules and interspersed with fibrous septa, with a structure similar to that of honeycombs and which had a uniform distribution throughout the tissue. These septa (reticula cutis superficialis) were well defined and oriented perpendicularly towards the surface and were strongly anchored to the dermis. (Silva. 2010.)

The SAT was histologically characterized by fibrous septa connecting the dermis with the fascia superficialis. These septa were composed of elastic and collagen fibers, which defined oval-polygonal lobules of fat cells.

The Deep Adipose Tissue (DAT) is present only in certain body sites: abdomen, flanks, trochanteric region, knees, back of the arms, and the upper third of the inner face of the thighs. In the instance of weight gain, it is responsible for localized
deformations, when its thickness increases disproportionally more than that of the SAT. (Gasperoni, 1995).
2-Ultrasound Anatomy of Subcutaneous Tissue Layer

Subcutaneous tissue appears on sonography as a hypoechoic layer mostly composed of hypoechoic fatty lobules separated by hyperechoic linear fibrous septa. Slow flow thin arterial and venous vessels are detected within this layer. The thickness of the subcutaneous tissue varies according to (Wortsman et al. 2006) Fig. 3 the corporal region. Thus, it may easily reach ≥1 cm in the abdominal wall or hips; however, it may be thin and measure <0.1 cm in the dorsum of the hands of a child.

![Fig. 3](image)

Normal sonographic appearance of the subcutaneous tissue (transverse views). (a) Grayscale ultrasound shows the hypoechoic fatty lobules and the hyperechoic fibrous septa of the subcutaneous tissue. (b) 3D reconstruction (5–8 s sweep)
On top of the subcutaneous tissue, there is a hyperechoic band that corresponds to the dermis. Beneath the subcutaneous tissue, other layers such as the hypoechoic fibrillar structure of the muscle layer or the hyperechoic fibrillar pattern of the tendons are detected. (Wortsman, 2017)

Sonographic Measurements in the Subcutaneous Tissue:
The current equipment allows us to measure directly from the machine the distance in all axes (cm), the area (cm²) or volume (cm³), and the peak systolic velocity of the vessels (cm/s). It is also possible to measure the resistive index of the arterial vessels (i.e., peak velocity systole – end velocity diastole/peak velocity systole), although this latter vascularity data is rarely used in the subcutaneous tissue, being more frequently used for assessing stenosis in the large arteries. (Wortsman., 2017)

It is also possible to qualify the changes in the echotexture patterns in case of abnormalities. For example, under inflammatory conditions, the echogenicity of the fatty lobules in the subcutaneous tissue usually increases (hyper echogenicity-white), and there may be anechoic fluid (black) within the septa. In the case of tumors, hypoechoic (gray) nodules that frequently show less echogenicity (dark) compared with the surrounding subcutaneous tissue can be found. (Wortsman., 2017)

Vascularity patterns can also be qualified and compared with the non-lesional region. These can be defined as hypervascular or hypovascular areas. (Wortsman., 2017)