



What is your diagnosis?

Tanınız nedir?

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Red exuding tumor on the forehead

A 75-year-old woman presented to our clinic with an asymptomatic exuding tumor on the left central forehead (Figure 1A). Recently, an infiltrative basal cell carcinoma (BCC) of the forehead was microscopically incompletely excised on three consecutive occasions by conventional resection. Following the last excision, the wound was left open. Two weeks later, physical examination showed an erosive, erythematous tumor of 3x3 cm in size. Some stages of re-epithelialization were already observed at the

wound edges. She had no cervical, axillary, or inguinal lymphadenopathy. Findings of the remaining head and neck examinations were normal. The histology from a superficial punch biopsy revealed abundant fibroblasts, small capillaries, and inflammatory cells (Figure 1B).

What is your diagnosis?

- Hypergranulation tissue,
- Basal cell carcinoma,
- Granuloma pyogenicum,
- Pleiomorphic dermal sarcoma.

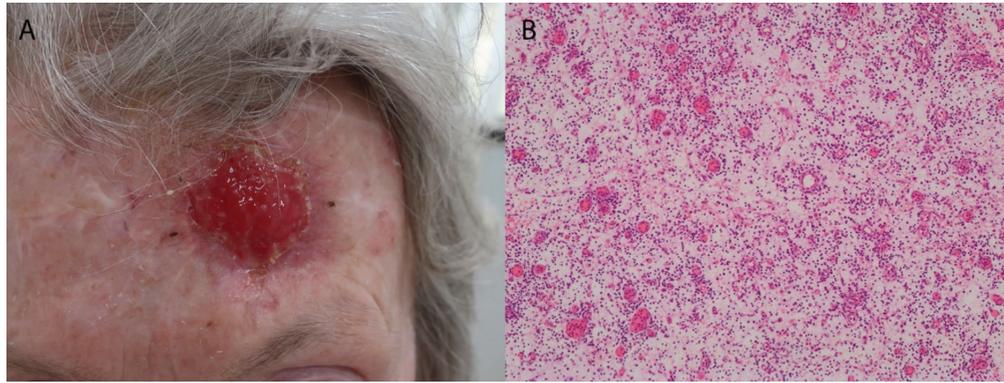


Figure 1. (A) Erythematous moist tumor on the left forehead. (B) Biopsy specimen showing abundant small capillaries, fibroblasts, loose connective tissues, and mixed inflammatory cell infiltrates (hematoxylin and eosin staining)

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Diagnosis

The diagnosis was hypergranulation tissue with a residual BCC at the bottom surface of the wound. The granulation tissue serves as "the filler of the wound." It develops from the base of the wound within the first days or weeks during healing and provides a surface for re-epithelialization from the wound margins when it has reached the appropriate skin level¹. Granulation tissue consists of a network of fibroblasts responsible for collagen formation, myofibroblasts that are necessary for wound contraction, macrophages that limit invasion of microorganism, and capillaries for tissue oxygenation. It can develop quickly. Clinically, it appears as a moist, red or pink vascular tissue². Re-epithelialization is seen at the wound borders as a thin white or pink layer of stratified epithelium that covers the granulation tissue, maturing into robust skin over time.

The development of granulation tissue in a wound is enhanced due to several conditions such as moisture, warmth, low oxygen tension, and low pH (enhances oxygenation at the wound). These conditions develop while applying appropriate occlusive bandage³.

Hypergranulation is an undesired healing response, which is characterized by an overgrowth of capillaries and fibroblasts, with a structure similar to healthy granulation tissue⁴. Excessive production of granulation tissue is harmful for wound healing, as it impedes re-epithelialization. Moreover, hypergranulation tissue may increase the risk of scar formation by forcing the wound edges further apart⁴. Hypergranulation can be caused due to dysregulation of matrix metalloproteinases (MMPs). These proteolytic enzymes function in the extracellular space of cells and degrade both matrix and non-matrix proteins. They play important roles in morphogenesis, wound healing, tissue repair, and remodeling in response to injury, notably during the proliferative wound-healing phase. MMPs play a vital role in the collagen formation, where the balance between collagen synthesis and lysis provides an optimal environment for new connective tissue formation and degradation of the extra cellular matrix, which serves as a support matrix for the granulation tissue during the proliferative phase⁵. Other causes for hypergranulation include irritation by foreign bodies, which can be caused by dressing material fibers, prolonged inflammation, or infection⁶.

Mild hypergranulation can dissolve spontaneously over time as the wound contracts. Applying a wound dressing that prevents moisture, warmth, and hypo-oxygenated environment can help

resolve hypergranulation of tissue⁴. Treating inflammatory response by applying topical steroids and avoiding irritants in the wound can also diminish hypergranulation tissue. Other treatment options cited in the literature include shave excision, curettage, and surgery to mechanically debride the excess tissue and cautery, laser therapy, topical silver nitrate, phenols, copper sulfate, and aluminum chloride to etch it³.

The cause of hypergranulation in this case remains speculative, although it was most likely due to the constant application of dressings. We chose Mohs micrographic surgery (MMS) as the treatment option since the residual tumor localized on the head and neck region after the previous incomplete conventional excision. The residual BCC was treated by MMS. In the first round, the hypergranulation tissue was removed by shave excision, and the bottom surface of the wound was excised for frozen section histology to check for microscopically free margins of the excision before wound closure, as per the protocol in our institution for MMS. The BCC was completely removed after two rounds of MMS. The wound was closed by a full-thickness skin graft.

Ethics

Informed Consent: It was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: R.O., R.E.G., Concept: R.O., R.E.G., Design: R.O., R.E.G., Data Collection or Processing: R.O., R.E.G., Analysis or Interpretation: R.O., R.E.G., Literature Search: R.O., R.E.G., Writing: R.O., R.E.G.

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