

Section 1. Clinical medicine

<https://doi.org/10.29013/ELBLS-22-2-3-6>

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CALCIFICATION OF INTACT EAR PINNA'S TISSUE AS A CONSEQUENCE OF SURGICAL OPERATION PERFORMED WITHIN NEARBY AREA

Abstract. Many manipulations and diagnostic procedures can lead to different and sometimes unexplained outcomes, like elongation of patient's uvula after an esophagogastroduodenoscopy [1]. One of such examples could be calcification in different areas of our body without obvious reasons. Tissue calcification in most cases is considered to be pathological. This process can arise due to tissue trauma, surgical operations, chronic diseases (for ex. chronic pancreatitis), or due to some infections like tuberculosis. Most reasons, which could be the causes of calcification are well-known nowadays. For example, in case of mammary gland trauma, calcification of its tissue is expected outcome. This is also could be true in case of chronic pancreatitis, in which during saponification processes, the calcification remnants are stored in gland's parenchyma. Nevertheless, predisposition of some parts and tissues of organism to this process had been observed, for example, in tissues rich in fat, like mammary gland or abdominal pad. Bacterial infection, for example, endocarditis can be complicated not only by septic embolism, but also by tissue calcification [2]. Also as examples: glands of inner and outer secretion, as also different types of tumors, for example Sertoli cell tumor [3]. However, in some cases no clear reasons can be established. The case of calcification of intact ear pinna's tissue after an operation performed within nearby area is discussed in this article.

Keywords: pathology, plastic surgery, medicine, calcification.

Calcification is a complex process, which occurs due to a trigger. These triggers could be traumas, infections, surgical operations, or chronic diseases.

Mechanisms differ between each other. In case of metastatic calcification the leading cause is hypercalcemia, which can lead to decreased ability to

excrete calcium. In this case, all tissues and organs are included in pathological process.

In calcium dystrophy a.k.a. petrification, there is only local involvement. This type of calcification is common in tuberculosis, infarctions or in areas of chronic inflammation like endocarditis. One of the

trigger is a tissue trauma like surgery or an injury. In this case there is a partial injury and death of some parts of tissue. Denaturated proteins bind phosphate, which binds calcium and makes insoluble particles. In normal state these particles are excreted via blood vessels, however, if a process is highly active, calcium particles are stored in damaged areas

By the way, there are no research, which could explain why calcium is stored in undamaged areas without any triggers. An example of calcification of normal tissues is represented below.

A 24-year-old woman came to plastic surgery clinic «Capital-Med» due to aesthetic defect in her ear`s pinna after she was wearing jewelry tunnels. She was complaining about inability to wear earrings. During examination, no abnormalities were observed. According to her words, she has not got any chronic diseases like Diabetes mellitus, Ehlers-Danlos syndrome, different types of coagulation pathologies and so on. Her blood count, coagulation profile studies and ECG did not reveal any abnormalities. Her siblings haven`t got any history of chronic diseases also.



Figure 1. Initial closure of aesthetic defect

The decision was made just to close the aesthetic defect via deepidermisation and Prolen 7\0. No intradermal sutures were used. Sutures were removed on the 7th day. There were no any abnormalities noticed next two months.

She came back after 2 months due to strange feelings in her pinna. During examination, there was a dense component, 1 mm. and the distance from initial operation site was about 0.7 cm. No translumination and fluctuance were observed. The lesion was harmless and fixed. According to her words, it appeared after 2.5 months after a surgical operation. At first, it was assumed that the lesion was just an intradermal stich, however, no intradermal sutures were used. According to her words, the lesion has appeared just in one day, and has not been increasing or decreasing in size. She also has not mentioned similar episodes before.

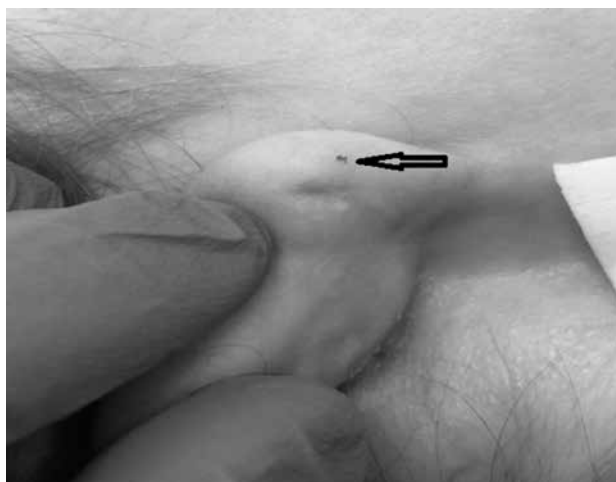


Figure 2. The area of calcification (arrow). Note the distance between the original scar and calcification area

The decision was made to excise the lesion through posterior side of pinna. There was no opportunity excise the whole lesion and we did it step by step. That is why we did not take a picture of a lesion due to lack of clinical significance. After excision, the lesion had been taken to a pathology department. It was confirmed that calcification had occurred in a healthy, previously undamaged area. One of the shot is below. We used Levenhook camera to make a shot. Hematoxylin and eosin stain were used to made a specimen. There were many similar shots like we have represented below. After an excision, there was no recurrence of this or similar conditions even after her blepharoplasty 3 months later.

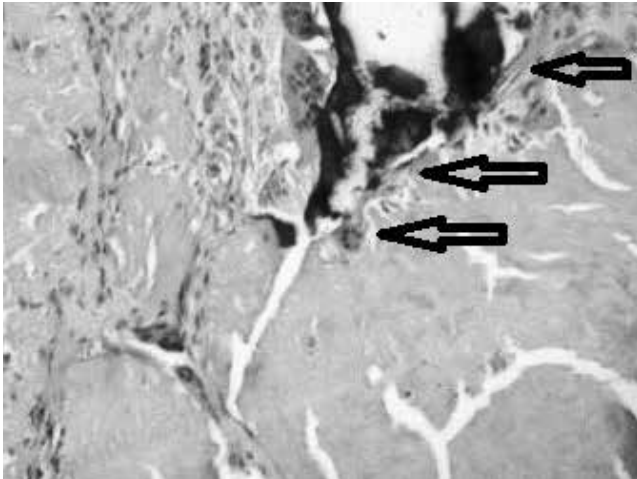


Figure 3. Histological appearance of excised tissue. Calcification (arrowed) is surrounded by healthy, intact tissue

This case report could be an example of a calcification process in a healthy area. Authors linked this process with the previous surgery, but the question ‘Why calcification took place in a healthy area instead of the surgery area?’ remains unanswered. At first, authors can suggest that this is could be an example of “reactive” calcification, in which damage to nearby tissue could increase an amount of inflammatory mediators, which could trigger any area in our body, especially the area which is near the site of the previous surgery. During tissue trauma, there is sudden release of huge amount of cytokines. After initial phase of inflammation, there is the phase in which granulation tissue forms. During this phase, an exposed and previously damaged area is prone to calcification since granulation tissue has an acidic environment in which calcium is more likely to bind a phosphate [2]. This phase ususally takes 3 weeks to resolve completely. This is highly unlikely that in a healthy person without any history of connective tissue disease this process could last longer. Even if it is, there were no data found about this type of pathological process. Secondly, this could be just a coincidence. There are many articles about spontaneous calcification, for example, calcification of arteries and cartilage in mice. However, it can not be exactly compared to a human`s body, but the structure of cartilage in mice and in humans remains almost the

same [4]. There is also one more thing to consider – calcinosis cutis. It is well known, that calcinosis cutis can occur in any part of a skin including eyelids, finger pads and ear`s pinna without obvious reasons. However, this process is rarely isolated and spontaneous. In general, calcinosis cutis tends to occur in chronic and periodic way. It also can be linked to many autoimmune conditions like Systemic Lupus Erythematosus, Ehlers-Danlos syndrome, CREST syndrome, Scleroderma and so on [5]. However, there was not either evidence of these diseases in the patient or family history of any kind of skin and connective tissue pathology. Additionally, reduced blood flow can be a reason of this pathological process. However, it is not linked with calcification directly. Lack of sufficient blood flow can lead to chronic inflammation and can be a reason of poor wound healing [6]. Poor wound healing and chronic inflammation are the main reasons of local calcification process due to, as was mentioned before, acidic environment in which calcium is more prone to be stored in tissues. However, in this case, it is impossible to consider because the pathological process took place in healthy and undamaged tissue, which was not touched during surgery and the blood flow was not reduced. The last point to consider is an infection. Many local and systemic infections can lead to chronic inflammation and to granulated and calcified areas [2]. Besides chronic inflammation, there is one more pathway in which calcification can take place. The similar mechanism we can see in tuberculosis, where macrophages attack Mycobacteria, but due to its thick cell wall, they can not eliminate the bacteria completely. The result is the Ghon complex, in which caseous necrosis takes place. Many other infections can also lead to similar granulomatous pattern, but it has its own characteristic microscopic appearance, which haven`t been observed by authors. Moreover, during regular appointment visits after surgery, there were no signs and symptoms of any kind of infection or inflammation. To sum it up, there are no obvious reasons, which could explain calcification of intact tissue in this case.

Conclusions: This clinical example demonstrates that a calcification process after tissue trauma could arise not only within exposed tissue, but also within healthy tissues, which takes place near the exposed ones. This conclusion could suggest that a calcification process, in some cases, can be

chaotic and could not have an obvious explanation or any association with a trigger.

It also could be assumed, that a similar phenomenon could take place in any other surgical procedure. No similar case reports were discovered by authors.

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