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Radicular cysts and Chin implants; An unexpected complication prompting explantation – Case report

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ABSTRACT

INTRODUCTION: Implant-based genioplasty is a simple and safe but not complication-free cosmetic procedure. Patients are commonly briefed about anticipated complications and their management pre-operatively, but few unexpected complications may arise; and this case report is an example. This paper is the first to report a radicular cyst fistulating through chin implant pocket to the skin. Moreover, we present our prevention strategy and recommendations.

PRESENTATION OF CASE: A 39-year-old-lady underwent a silicone implant-based genioplasty that was uneventful. Later, she developed a reddish nodule on the chin necessitating fistulectomy followed by a recurrence leading to explantation. It was not until the second recurrence that a fistulating radicular cyst was discovered and was treated with the help of a dentist.

DISCUSSION: Radicular cysts are benign, inflammatory cysts that arise in a background of dental trauma or caries. No link has been discovered yet between silicone implants and radicular cysts or fistulating cysts. Moreover, we propose that poor oral hygiene could be implicated in the development of these cysts. Dental panoramic X-ray has been used to diagnose radicular cysts, but its efficacy as a screening tool needs to be studied. Finally, the recurrence rate of radicular cysts is unknown.

CONCLUSION: In a patient with chin implant, radicular cysts could lead to a disastrous outcome. Through history and physical examination, a plastic surgeon should identify patients with poor oral hygiene and dental trauma prior to implant-based genioplasty to arrange for a dental panoramic X-ray. Patients known to have radicular cysts should not undergo an implant-based genioplasty.

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1. Introduction

Inspired by humane instinct towards aesthetic perfection, patients commonly resort to chin augmentation, or genioplasty, to fulfill their wishes [1]. While it could be performed through injectables, implants, or osseous genioplasty, all three methods share a common ground in terms of cost-effectiveness, safety, and achieving patient satisfaction [2,3]. As autogenous implants are known for many complications, alloplastic material gained edge over the latter owing to its safety profile [4,5].

Notwithstanding, a proportion of patients are destined to experience some of the unfortunate complications, which are fortunately rare [2,3]. These could be as dramatic as a superimposed infection or implant exposure to a simple hematoma or a noticeable scar [3,5]. The negative impact of these complications could be blunted, on both the patient and surgeon, if the patient is

well-informed by the operating surgeon about their nature and management roadmap should one of them emerge. However, it is much difficult when the complication is completely unexpected. In concordance with the SCARE grid [6], this case report presents one of these “Unpleasant surprises”, namely the odontogenic radicular cyst, which is usually silent until it grows large enough to be symptomatic [7]; herein we narrate the case of a lady who underwent implant-based genioplasty complicated by a cutaneous fistula that posed a diagnostic stalemate, until the cause was found to be a radicular cyst. The objective of this case report is to propose our prevention protocol so less surgeons fall to this. In addition to reporting the extremely rare presentation that is not reported in the literature.

2. Case

A healthy 39-year-old lady, with suboptimal oral hygiene, presented to a plastic and reconstructive surgery senior consultant in his private plastic surgery clinic with retrognathia. Subsequently, she underwent a silicone-based genioplasty where an extraoral, submental approach was followed; a subperiosteal pocket was created to accommodate a large size silicone implant and was copi-

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Fig. 1. This photograph shows the small reddish nodule located at patient's chin.

ously irrigated with antibiotics. To stabilize the implant in place, nylon suturing material was employed and the muscular layer was approximated over the implant with layered closure. The patient enjoyed an uneventful peri-operative and post-operative course until interrupted by a small chin nodule a month later that had recently appeared (Please refer to Fig. 1).

Other than the dark red chin nodule and the erythematous appearance of the chin, there were no symptoms such as pain or discharge. On physical examination, the patient was afebrile with the other vital signs within the normal limits; there was no sign of an active infection locally. The 4 × 5 mm nodule sitting at the surgical site was characterized by hypertrophic tissue. The initial differential diagnoses included suture granuloma or abscess, infected abscess, or a cutaneous fistula. The proposed step was to remove the implant in the operation theatre, however the patient, driven by the fear of losing the aesthetic bonus of the implant, refused and was inclined for a conservative “watchful waiting” strategy, which went in vain after three weeks.

Eventually, the patient agreed to fistulectomy and implant preservation; intraoperatively, the implant pocket was opened, a swab was taken for culture and sensitivity (Result was negative later on), and was washed with antibiotic solution. Finally, turbid fluid was drained and the fistula was excised before wound closure. Two weeks later, the patient returned to the clinic with an identical de novo lesion. Hence the patient agreed to implant removal. Three weeks following the implant removal, another lesion appeared at

the edge of the surgical site. The patient was taken for thorough examination in the operation room under local anesthesia. To track the fistula, methylene blue was injected. Upon tailing down the fistula, and intra-osseous lesion was discovered in the dental root. As a result, and oral and maxillofacial (OMF) surgeon was consulted to investigate and manage this condition. A panoramic dental X-ray revealed bilateral mandibular cysts, one of which was fistulating with the implant pocket- making it the de facto cause behind the complication (Please refer to Fig. 2). It was diagnosed as a radicular cyst and was managed by the OMF surgeon; a lateral incision followed by curettage of all involved bone tissue was done, and the wound was regularly packed and left open until closed by secondary healing. Before the patient lost follow-up in the plastic surgery clinic, there had been no recurrence for three months after cyst management.

3. Discussion

Defined as fluid or semi-fluid containing cavities with epithelial in-lining that originate from epithelial tissues comprising the tooth-forming apparatus [7,8], odontogenic cysts are categorized into developmental or inflammatory. Accounting for at least 60 % of the cysts, radicular cysts, also known as periapical cysts, are thought to fall in the latter category [9], with most of the lesions arising from the maxilla rather than the mandible unlike our case [7]. It is uncustomary to detect radicular cysts based on patient's complaints as they are clinically silent and incidentally found in radiographic films. However, they may become a source of pain once large enough [7]; sinus formation is less reported but this is the first case in the literature where a fistula originating from a radicular cyst communicates to the skin after passing through the implant pocket and necessitating explantation. On X-rays, a round lucency surrounded by radiopaque peripheries extending from the lamina dura of the nonvital tooth are characteristics that suggest a probable radicular cyst. Histopathological examination is the gold standard for diagnosis, where mucous or ciliated cells float within squamous cell-lined cavity with deposits of cholesterol, products of cell's breakdown, and protein [7].

While the particular details of the pathophysiology and driving mechanisms behind these cysts remain disputed, we propose that suboptimal oral hygiene could be implicated in the development of this condition on the premise of its chronic inflammatory origin, the tendency of this lesion to co-exist with other identical lesions, and associated dental caries [7,9], suggesting a global pathophysiology. Therefore, we suggest that screening dental panoramic X-ray should be considered in this situation to prevent a potential implant sacrifice. Likewise, patients with history of dental trauma should be considered for a screening X-ray as its associated with radicu-

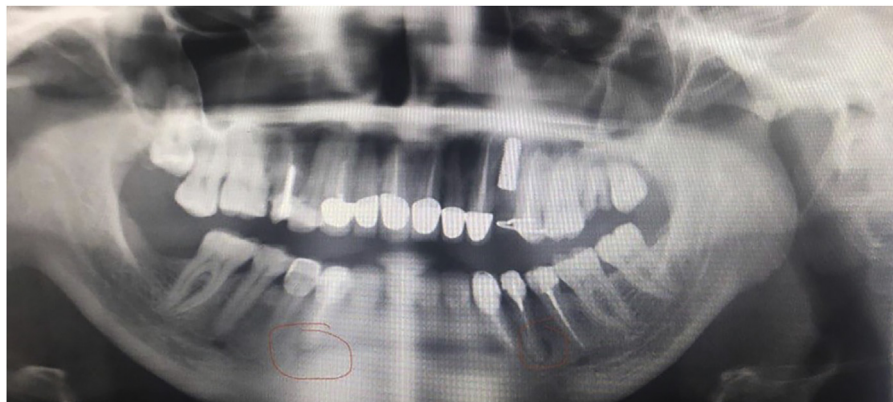


Fig. 2. This is a dental panoramic X-ray that shows the bilateral radicular cysts circled in red.

lar cysts [7,10]. Cone beam CT is inappropriate as a screening tool as it is classically used for anatomic delineation and pre-operative planning for large radicular cysts [11]. The recurrence rate has not been investigated up to our literature review; therefore, the decision to perform an implant-based genioplasty on a patient known to be treated for a radicular cyst is to be taken with extreme caution. It is unlikely that the radicular cysts appeared due to the implant, as no link is found between them in the literature, but we cannot overlook the possible role of the latter in stimulating fistulation. Silicone implant was used due to its safety, wide availability, minimal tissue reaction, biological inertion, and pliability [5]. Overall, larger-scale studies with the proper design are required to link poor mouth hygiene to radicular cysts, to define the appropriateness of the dental panoramic X-ray as a screening tool, and to detect radicular cysts recurrence rate.

Radicular cysts are classically managed based on their size by the OMF surgeon. While the petit ones are removed by root canal treatment, extraction of the associated nonvital tooth, or simply regress over time, enucleation or tooth extraction is often required for larger cysts. A small proportion of these lesions survive the management, particularly when curettage is inadequate [9,10], as “Residual cysts” and can be enucleated or marsupialized [7].

4. Conclusion

After the nose, the chin is probably the most prominent aesthetic landmark in the caudal facial hemisphere, and cosmetically balanced facial features can be reached through implant-based genioplasty. Complications are always expected in any surgical intervention, regardless of the surgeon veterancy and patient optimization; and their management could be carried out without compromising patient trust in their treating surgeon. However, this relationship could be shaken once a complication that is unknown to the surgeon arises. An example of such unanticipated complications is featured in this case report, where a middle-aged lady lost her chin implant due to a silent radicular cyst, an inflammatory, benign odontogenic cyst, that has fistulated through the implant pocket to the skin. We recommend a pre-operative dental panoramic X-ray for candidates to implant-based genioplasty known for improper oral hygiene or dental trauma, with subsequent referral to a dentist once a radicular cyst was detected on X-ray. Moreover, the rate of periapical cyst recurrence is unknown, making implant-based genioplasty a potentially unwise choice for patients known to have had these cysts. Large scale studies are required to investigate the efficiency of the dental panoramic X-ray as a screening tool.

Declaration of Competing Interest

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Ethical approval

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Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

- 1 Mohamed A. Mrad: Patient management and manuscript editing.
- 2 Qutaiba Shah Mardan: Manuscript writing and editing.
- 3 Nehal Mahabbat: Manuscript writing and editing.

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