Protet Stomatol, 2026; 76(3): 266-274
DOI: 10.5114/ps/237488

Late asymptomatic recurrence of cementoblastoma detected during implant planning – case report

Późny bezobjawowy nawrót cementoblastomy wykryty podczas planowania implantacji – opis przypadku

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KEY WORDS:
odontogenic tumours, cementoblastoma, recurrence, piezoelectric surgery

HASŁA INDEKSOWE:
guzy odontogenne, cementoblastoma, nawrót, chirurgia piezoelektryczna

Summary

Cementoblastoma is a rare benign odontogenic tumour characterized by its intimate fusion to the tooth root and its potential for recurrence following incomplete excision. Recurrence after tooth extraction remains exceptionally uncommon and may present significant diagnostic challenges, particularly in edentulous sites undergoing implant assessment.

A 40-year-old woman was referred for implant rehabilitation at the site of tooth 46, seven years after surgical removal of a lesion associated with the same tooth. During preoperative evaluation, cone-beam computed tomography (CBCT) incidentally revealed a well-circumscribed radiopaque lesion at the edentulous mandibular site, raising suspicion of late recurrence. Surgical excision was performed using piezoelectric surgery to achieve precise osteotomy while preserving adjacent anatomical structures. Histopathological examination confirmed recurrent benign cementoblastoma.

This case highlights an unusual late recurrence following tooth extraction, posing diagnostic challenges due to its atypical radiological presentation. The role of CBCT in diagnosis and surgical planning is emphasized. Piezoelectric surgery offered enhanced precision, reduced

Streszczenie

Cementoblastoma to rzadki, łagodny guz zębopochodny, charakteryzujący się ścisłym zrostem z korzeniem zęba i możliwością nawrotu po niepełnym wycięciu. Nawrót po ekstrakcji zęba jest wyjątkowo rzadki ale może stanowić poważne wyzwanie diagnostyczne, szczególnie w przypadku przestrzeni bezzębnych poddawanych ocenie implantologicznej.

40-letnia kobieta została skierowana na rehabilitację implantologiczną w miejscu zęba 46, siedem lat po chirurgicznym usunięciu zmiany związanej z tym samym zębem. Podczas oceny przedoperacyjnej, tomografia komputerowa wiązki stożkowej (CBCT) przypadkowo ujawniła dobrze ograniczoną, nieprzezierną zmianę w bezzębnej żuchwie, co wzbudziło podejrzenie późnego nawrotu. Chirurgiczne wycięcie wykonano metodą piezoelektryczną, aby uzyskać precyzyjną osteotomię z zachowaniem sąsiednich struktur anatomicznych. Badanie histopatologiczne potwierdziło łagodną cementoblastomę.

Przypadek ten wskazuje na nietypowy późny nawrót po ekstrakcji zęba, stwarzający trudności diagnostyczne ze względu na nietypowy obraz radiologiczny. Podkreśla się rolę tomografii CBCT w diagnostyce i planowaniu zabiegów chirurgicznych. Chirurgia piezoelektryczna oferuje większą

trauma and improved safety near vital structures.

Late recurrence of cementoblastoma may occur several years after apparent complete excision and remain asymptomatic until incidental detection during implant planning. Long-term radiological surveillance, particularly with CBCT, should therefore be considered before implant rehabilitation in patients with a history of cementoblastoma. Piezoelectric surgery may optimize conservative management of recurrent lesions close to critical anatomical structures.

precyzję, mniejszą urazowość i większy margines bezpieczeństwa w pobliżu ważnych struktur anatomicznych. Późny nawrót cementoblastomy może wystąpić kilka lat po pozornym całkowitym wycięciu i pozostać bezobjawowy aż do przypadkowego wykrycia podczas planowania implantacji. Dlatego przed rehabilitacją implantologiczną u pacjentów z cementoblastomą w wywiadzie należy rozważyć długoterminową obserwację radiologiczną, szczególnie z wykorzystaniem tomografii CBCT. Chirurgia piezoelektryczna może zoptymalizować zachowawcze leczenie zmian nawrotowych w pobliżu ważnych struktur anatomicznych.

Introduction

Cementoblastoma is a rare benign odontogenic tumour of mesenchymal origin, accounting for less than 1% of all odontogenic tumours according to the 2022 WHO Classification of Head and Neck Tumours.[1-3] It is characterized by the proliferation of cementoblasts forming a mineralized, cementum-like mass that is intimately fused to the root of the affected tooth.[1] This tumour most commonly occurs in the mandibular molar region, particularly involving the first molar, and predominantly affects young adults, with a slight male predilection.[1,2]

The standard treatment consists of complete surgical excision of the lesion along with extraction of the associated tooth.[1,2] However, recurrence has been reported in the literature, most often due to incomplete lesion removal or residual cementoblastic tissue at the surgical margins.[4,5]

In recent years, piezoelectric surgery has emerged as a valuable technique in oral and maxillofacial surgery, offering several advantages over conventional rotary instruments, including enhanced precision and selective cutting.[6,7] Although its use in the management of benign jaw tumours has shown promising results, its application in cases of recurrent cementoblastoma remains exceptionally rare in the literaturę.[7]

To our knowledge, late recurrence of cementoblastoma following tooth extraction remains exceptionally rare, and the use of piezoelectric surgery in this context has been scarcely reported.

We report a rare case of asymptomatic late recurrence of cementoblastoma detected incidentally during implant planning seven years after tooth extraction and initial surgical treatment. The present report emphasizes the diagnostic value of CBCT and highlights the potential advantages of piezoelectric surgery in the conservative management of recurrent lesions in anatomically sensitive areas.

Case Report

This case report was prepared in accordance with the CARE guidelines.

A 40-year-old female patient, in good general health, presented to the Department of Oral Medicine and Oral Surgery for preoperative implant assessment at the site of tooth 46. She provided a panoramic radiograph (Fig. 1), cone-beam computed tomography (CBCT) scans obtained prior to the initial intervention (Fig. 2), and a follow-up panoramic radiograph performed five years after the first surgery (Fig. 3).

The patient reported a history of surgical excision of a lesion associated with tooth 46 approximately seven years earlier at another institution, with a histopathological report from the initial procedure confirming the diagnosis of benign cementoblastoma. Radiographic examination, including the panoramic view and cross-sectional images, revealed a well-circumscribed, hyperdense mass in intimate continuity with the root of the mandibular right first molar. The lesion appeared fused to the root structure and was partially surrounded by a thin radiolucent halo. Evidence of buccolingual cortical expansion was noted, without signs of cortical perforation. The internal structure was predominantly mineralized, consistent with a densely calcified lesion.

These imaging features are highly suggestive of a cementoblastoma, particularly given the lesion's attachment to the tooth root and its predilection for the posterior mandible.

The radiographic differential diagnosis included osteoblastoma, hypercementosis, cemento-ossifying fibroma, and condensing osteitis. Osteoblastoma may present with similar radiopacity but lacks fusion to the tooth root. Hypercementosis is characterized by root enlargement while preserving the periodontal ligament space and lamina dura. Cemento-ossifying fibroma typically presents as a well-demarcated lesion but is not attached to the root. Condensing osteitis appears as a radiopaque area associated with inflammatory conditions and lacks a peripheral radiolucent halo.

The intimate fusion to the root, presence of a radiolucent halo and anatomical location strongly supported the diagnosis of cementoblastoma.

The patient was asymptomatic at the time of consultation, with no pain, swelling, or neurosensory disturbance of the inferior alveolar nerve. Intraoral examination revealed an edentulous ridge at site 46 with clinically normal overlying mucosa.

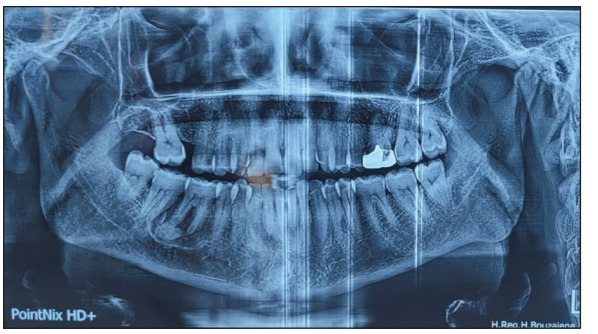

Fig. 1. A panoramic radiograph showing a round radiopacity with a radioopaque rim at the apical region of the right mandibular first molar tooth.

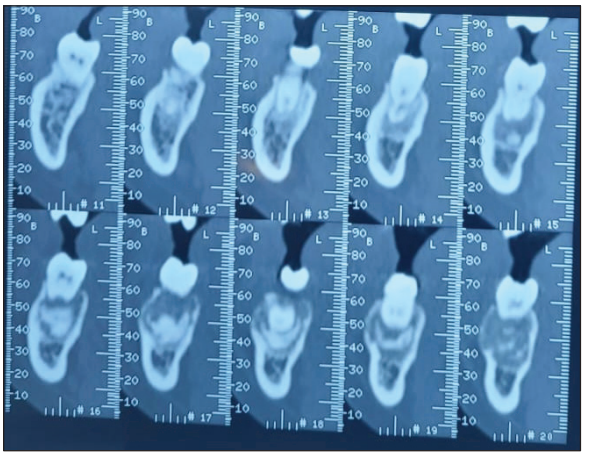

Fig. 2. CBCT Cross-sectional views of mandibular molar region showing radiopaque lesion attached to tooth root.

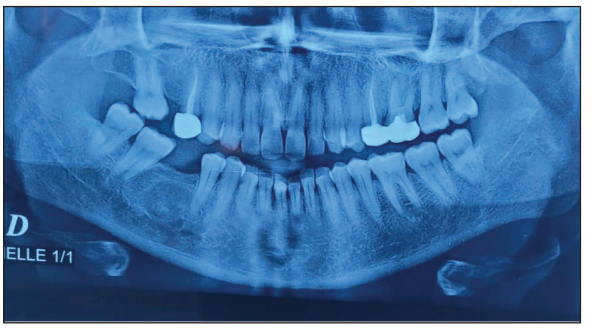

Fig. 3. Panoramic radiography five years post surgery.

Cone beam computed tomography (CBCT), performed as part of the preoperative implant workup, incidentally revealed a unilocular, well-defined mixed-density lesion, presenting with a central hyperdense component surrounded by a peripheral radiolucent halo, measuring

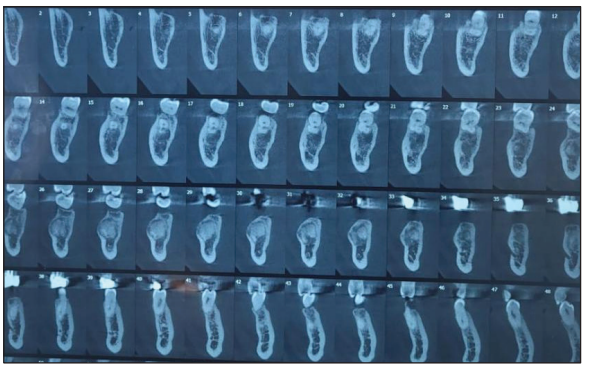

Fig. 4. Cross-sectional CBCT views showing a well-circumscribed radiopaque lesion at the edentulous site of tooth 46, surrounded by a thin radiolucent halo.

approximately 1 cm in its greatest dimension, at the site of tooth 46 (Fig. 4).

Given the patient's history and the radiological features, a diagnosis of recurrent cementoblastoma was suspected and surgical excision was indicated.

Under local anesthesia, a full-thickness mucoperiosteal flap was elevated at the site of tooth 46 (Fig. 5A). The lesion was identified and carefully delineated using a piezoelectric device, which allowed precise osteotomy of the surrounding bone while minimizing thermal and mechanical trauma to adjacent tissues (Fig. 5B–D). Complete excision of the lesion was performed, and the surgical cavity was thoroughly curetted (Fig. 5E). Primary wound closure was achieved using interrupted resorbable sutures (Fig. 5F).

The excised specimen was submitted for histopathological analysis (Fig. 6).

Histopathological examination of the specimen confirmed the diagnosis of recurrent benign cementoblastoma, characterized by dense mineralized cementum-like tissue exhibiting prominent reversal lines and lined by plump cementoblast-like cells within a fibrovascular stroma, without evidence of cellular atypia or mitotic activity.

The postoperative course was uneventful, with satisfactory wound healing observed at

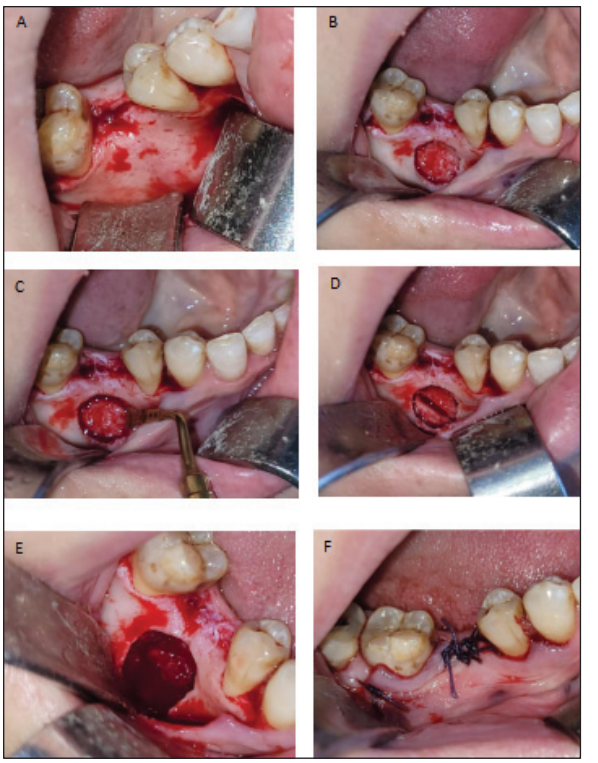

Fig. 5. Surgical excision; A – mucoperiosteal flap, B – identification of the lesion, C, D – piezoelectric osteotomy, E – curettage of the residual bony cavity, F – wound closure.

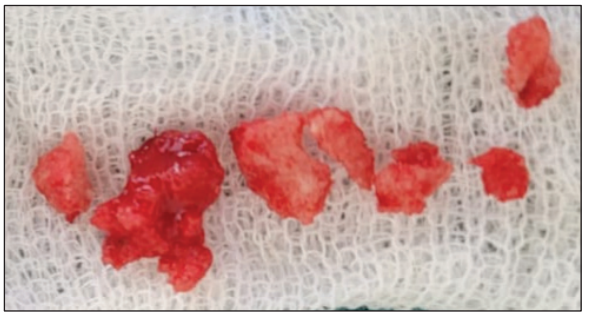

Fig. 6. The excised specimen.

follow-up visits (Fig. 7). The patient, currently under radiological surveillance prior to implant rehabilitation, demonstrated full adherence to the follow-up protocol (Fig. 8).

Discussion

Cementoblastoma is an uncommon benign odontogenic tumour of ectomesenchymal origin, constituting less than 1% of all odontogenic tumours.[1,2] The 2022 WHO Classification of

Fig. 7. Wound healing.

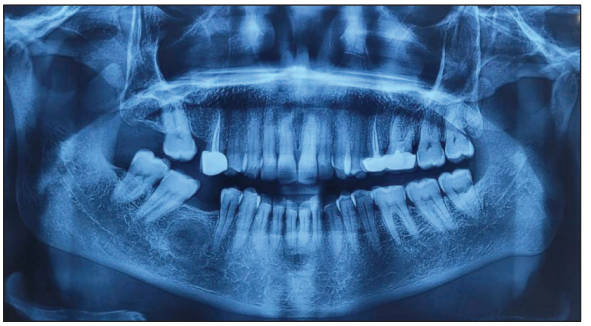

Fig. 8. Radiological surveillance (six months).

Head and Neck Tumours categorizes it as a benign odontogenic tumour, defined by the development of a cementum-like mineralized mass affixed to the root of the impacted tooth, with an acknowledged risk of recurrence, especially when excision is insufficiently performed.[3] The tumour primarily affects young adults in their twenties and thirties, exhibiting a slight male predominance and a significant preference for the mandibular first molar region, comprising approximately 70% of documented cases.[1,2,18]

Histologically, it is characterized by mineralized cementum-like tissue with prominent reversal lines, lined by active cementoblasts and surrounded by a fibrous connective tissue capsule.[1,3] These features were confirmed in the present case, supporting the diagnosis of true recurrence rather than a new primary lesion, although the patient's age at recurrence slightly exceeds the commonly reported range.

In most cases, the radiological presentation of cementoblastoma is pathognomonic. On conventional panoramic radiography, it presents as a well-defined radiopaque mass with a thin radiolucent halo around it, associated with the root of the affected tooth.[1,2] In cases of recurrence, especially when the associated tooth has been extracted, the radiological appearance may vary considerably, manifesting as a radiolucent or mixed lesion that can resemble other jaw pathologies, including residual cysts, ameloblastoma, or ossifying fibroma.[4,5]

In the present case, the lesion was incidentally detected during preoperative implant assessment as a well-defined mixed-density lesion at the edentulous site of tooth 46. This atypical presentation highlights the diagnostic challenge of recurrent cementoblastoma in the absence of the associated tooth and underscores the importance of correlating imaging findings with the patient's clinical and surgical history.

Cone-beam computed tomography (CBCT) played a pivotal role in this case by providing detailed three-dimensional information regarding lesion size, cortical expansion, and its relationship to the inferior alveolar nerve canal. Such information is essential for accurate diagnosis and surgical planning. CBCT has become an indispensable tool in the evaluation of odontogenic lesions, offering superior spatial resolution compared to conventional two-dimensional imaging, and enabling precise assessment of lesion boundaries and adjacent anatomical structures.[8,10]

The standard treatment of cementoblastoma consists of complete surgical excision of the lesion along with the associated tooth, as the tumour is intimately fused to the root apex and cannot be separated without risking incomplete removal.[1,2,5] When the tooth has already been extracted, as in the present case, surgical excision with thorough curettage of the bony cavity represents the treatment of choice, as

reported by *Argiolas* et al.[1] and confirmed by *Suhasini* et al.[5]

Recurrence is the main concern in the long-term management of cementoblastoma. Even though the tumour is not malignant, and does not metastasize, recurrence has been documented in fewer than twenty cases reported in the literature so far. This is usually because not all of the peripheral cementoblastic cells were removed at the surgical margins.[4,5,8] *Yoon* et al. highlighted that cementoblastoma could grow indefinitely and that complete removal of the tumour and the tooth that goes with it is necessary to lower the risk of recurrence.[4]

In the present case, recurrence occurred seven years after the initial surgical treatment, which represents one of the longest recurrence intervals reported in the literature. This exceptionally late recurrence suggests that residual cementoblastic cells may remain dormant for extended periods before resuming proliferative activity, a phenomenon that warrants particular attention in the long-term follow-up of these patients.[4,5] Some authors have advocated for more aggressive surgical approaches, including peripheral ostectomy with removal of the surrounding bone margin, to reduce the risk of recurrence.[2,5] However, such approaches carry a higher risk of complications, particularly injury to the inferior alveolar nerve, and must be carefully weighed against the benign nature of the tumour. In the present case, the use of piezoelectric surgery enabled precise delimitation of the surgical margins while preserving adjacent anatomical structures.

In this context, piezoelectric surgery offers a valuable alternative to conventional rotary instruments. This technique, based on ultrasonic microvibrations, allows selective cutting of mineralized tissues while preserving adjacent soft structures, including nerves and blood vessels. Its advantages include enhanced surgical precision, reduced intraoperative bleeding due to the cavitation effect, and minimized thermal damage to bone, thereby promoting improved postoperative healing. These features are particularly beneficial in recurrent cases, where anatomical landmarks may be altered, and proximity to critical structures increases surgical complexity.[6,7,11]

Evidence from the literature supports the clinical benefits of piezoelectric surgery, including reduced neurosensory complications, improved surgical visibility, and greater accuracy in osteotomy procedures.[6,14,22] In the present case, the use of piezoelectric surgery facilitated precise delimitation and complete removal of the lesion while preserving surrounding anatomical structures, thereby reducing the risk of additional morbidity.

The long-term management of patients with cementoblastoma requires careful consideration, particularly in cases of recurrence. The unusually delayed recurrence observed in this case suggests that short-term follow-up protocols may be insufficient. Extended radiological surveillance, including periodic panoramic radiography and CBCT when indicated, is therefore recommended.[7,20,21]

Regarding implant rehabilitation, a cautious approach is warranted. Although piezoelectric site preparation has been associated with improved implant stability and bone preservation, the risk of recurrence necessitates a delay in implant placement.[12,13,15] A disease-free interval of at least two to three years, combined with regular radiological monitoring, appears to be a prudent strategy before proceeding with implant therapy.[15-17]

Literature Review

A literature search was conducted using PubMed and Google Scholar databases up to [month/year], using the keywords "cementoblastoma" AND "recurrence" OR "recurrent," restricted to English-language case reports with individually documented patient data.

Table 1. Summary of all individually documented recurrent cementoblastoma cases reported in the literature

Author (Year)	N	Age	Sex	Site	Initial Treatment	Time to Recurrence	Tooth Extracted?	Imaging at Recurrence	Treatment
Brannon et al. (2002)[19]	13/44 (37.1%)	8–44 yrs (mean 20.7)	30M/14F	Mandible, 70% 1st molar	Excision ± curettage	Not specified individually	Yes (majority)	Radiopaque/ mixed + radiolucent rim	Re-excision + curettage / peripheral ostectomy
Mohammadi et al. (2018)[20]	1	4.5 yrs	M	Mandible, deciduous 2nd molar / permanent 1st molar	Surgical excision + extraction	1 yr (1st); 3 yrs (2nd)	Yes	Not specified	Surgical re-excision
Yoon et al. (2021)[4]	1	16	M	Mandible, right 1st molar (46)	Surgical excision + extraction	3 years	Yes	Three round foci, mixed radiopacity + radiolucent rim (panoramic + CBCT)	Surgical re-excision scheduled
Shinde et al. (2023)[21]	1	10	F	Mandible, left 1st molar (36)	Incomplete excision + extraction + bone graft	8 months	Yes	Mixed hypodense-hyperdense lesion + cortical expansion (CBCT)	Piezoelectric excision under general anesthesia
Oya et al. (2024)[2]	1	29	F	Mandible, right 3rd molar (48)	Excision	5 years	Yes	Multicentric radiopaque lesions (panoramic)	Surgical re-excision
Present case (2026)	1	40	F	Mandible, right 1st molar (46)	Surgical excision + extraction	7 years	Yes	Mixed-density unilocular lesion, 1 cm (panoramic + CBCT)	Piezoelectric excision under local anesthesia

To date, only a limited number of individually documented cases of recurrent cementoblastoma have been reported. The largest series was published by *Brannon* et al. in 2002, who identified 13 recurrences among 44 cases of cementoblastoma, representing a recurrence rate of 37.1%.[19] Since then, only a few individual case reports of recurrent cementoblastoma have been published, each contributing unique clinical and radiological data to the understanding of this rare complication.[4,21,22] Table 1 summarizes all individually documented recurrent cementoblastoma cases available in the literature, including the present case. Notably, our patient represents the oldest reported case at 40 years of age, with the longest documented recurrence interval of seven years, and is only the second case in the literature to be managed with piezoelectric surgery.[22]

Overall, this case highlights the diagnostic and therapeutic challenges associated with recurrent cementoblastoma, particularly in edentulous sites, and underscores the importance of advanced imaging and minimally invasive surgical techniques in optimizing patient outcomes.

Further prospective studies with longer follow-up durations are required to better define evidence-based protocols for both surgical management and prosthetic rehabilitation in patients presenting with recurrent odontogenic tumours.[8,9]

Conclusions

This case underscores the potential for late recurrence of cementoblastoma even after apparent complete excision and tooth extraction, highlighting the need for prolonged radiological surveillance. The atypical presentation in an edentulous site may complicate diagnosis and require careful correlation with clinical history and imaging findings. Piezoelectric surgery proved to be a valuable approach in the management of this recurrent lesion, offering precise and minimally invasive bone cutting while preserving adjacent anatomical structures. This report contributes to the limited body of literature on recurrent cementoblastoma and supports the integration of advanced surgical techniques in its management.

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Zaakceptowano do druku: 17.09.2026 r.:

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