

Supplementary Material

Supplementary File 1. Search strategies

Pubmed	("Molecular Targeted Therapy" OR "Molecular Targeted Therapies" OR "Targeted Therapy, Molecular" OR "Therapy, Molecular Targeted" OR "Targeted Molecular Therapy" OR "Molecular Therapy, Targeted" OR "Targeted Molecular Therapies" OR "Therapy, Targeted Molecular" OR "targeted therapies" OR "targeted therapy" OR "therapeutic target" OR "personalized medicine" OR "Medicine, Precision" OR "Personalized Medicine" OR "Medicine, Personalized" OR "Individualized Medicine" OR "Medicine, Individualized" OR "P Health" OR P-Health OR "Predictive Medicine" OR "Medicine, Predictive" OR Theranostics OR Theranostic OR "precision medicine" OR "BRAF/MEK targeting therapy" OR "MAPK-targeted therapies" OR "MAPK-targeted therapy" OR "BRAF-targeted therapy" OR "BRAF-targeted therapies" OR vemurafenib OR PLX4032 OR PLX 4032 OR RG7204 OR RG-7204 OR "RG 7204" OR Zelboraf OR R05185426 OR "BRAF inhibitor" OR BRAFi OR dabrafenib OR "GSK 2118436" OR "GSK2118436" OR "GSK-2118436" OR trametinib OR "JTP 74057" OR "GSK 1120212" OR "BRAF-targeted inhibition" OR "MEK inhibitor" OR "U 0126" OR U0126) AND ("odontogenic tumor" OR "odontogenic tumour" OR "Tumor, Odontogenic" OR "Tumors, Odontogenic" OR "Neoplasms, Dental Tissue" OR "Dental Tissue Neoplasms" OR "Dental Tissue Neoplasm" OR "Neoplasm, Dental Tissue" OR "Tissue Neoplasm, Dental" OR "Tissue Neoplasms, Dental" OR "odontogenic neoplasm" OR "Benign epithelial odontogenic tumours" OR "Benign epithelial odontogenic tumors" OR "Adenomatoid odontogenic tumour" OR "adenomatoid odontogenic tumor" OR "squamous odontogenic tumour" OR "squamous odontogenic tumor" OR "Calcifying epithelial odontogenic tumour" OR "Calcifying epithelial odontogenic tumor" OR Ameloblastoma OR Odontoma OR "Primordial odontogenic tumour" OR "Primordial odontogenic tumor" OR "Ameloblastic fibroma" OR "Dentinogenic ghost cell tumour" OR "Dentinogenic ghost cell tumor" OR "Odontogenic fibroma" OR Cementoblastoma OR "Cemento-ossifying fibroma" OR "Odontogenic myxoma" OR "Malignant odontogenic tumours" OR "Malignant odontogenic tumor" OR "Sclerosing odontogenic carcinoma" OR "Ameloblastic carcinoma" OR "Clear cell odontogenic carcinoma" OR "Ghost cell odontogenic carcinoma" OR "Primary intraosseous carcinoma, NOS" OR "Odontogenic carcinosarcoma")
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Web of Science	(ALL=("odontogenic tumor" OR "odontogenic tumour" OR "Tumor, Odontogenic" OR "Tumors, Odontogenic" OR "Dental Tissue Neoplasm" OR "odontogenic neoplasm" OR "Adenomatoid odontogenic tumour" OR "adenomatoid odontogenic tumor" OR "squamous odontogenic tumour" OR "squamous odontogenic tumor" OR "Calcifying epithelial odontogenic tumour" OR "Calcifying epithelial odontogenic tumor" OR ameloblastoma OR odontoma OR "Primordial odontogenic tumour" OR "Primordial odontogenic tumor" OR "Ameloblastic fibroma" OR "Dentinogenic ghost cell tumour" OR "Dentinogenic ghost cell tumor" OR "Odontogenic fibroma" OR cementoblastoid OR "Cemento-ossifying fibroma" OR "Odontogenic myxoma" OR "Malignant odontogenic tumours" OR "Malignant odontogenic tumor" OR "Sclerosing odontogenic carcinoma" OR "Ameloblastic carcinoma" OR "Clear cell odontogenic carcinoma" OR "Ghost cell odontogenic carcinoma" OR "Primary intraosseous carcinoma, NOS" OR "Odontogenic carcinosarcoma")) AND ALL=("Molecular Targeted Therapy" OR "Molecular Targeted Therapies" OR "Targeted Therapy, Molecular" OR "Therapy, Molecular Targeted" OR "Targeted Molecular Therapy" OR "Molecular Therapy, Targeted" OR "Targeted Molecular Therapies" OR "Therapy, Targeted Molecular" OR "targeted therapies" OR "targeted therapy" OR "therapeutic target" OR "personalized medicine" OR "Medicine, Precision" OR "Personalized Medicine" OR "Medicine, Personalized" OR "Individualized Medicine" OR "Medicine, Individualized" OR "P Health" OR p-health OR "Predictive Medicine" OR "Medicine, Predictive" OR theranostics OR theranostic OR "precision medicine" OR "BRAF/MEK targeting therapy" OR "MAPK-targeted therapies" OR "MAPK-targeted therapy" OR "BRAF-targeted therapy" OR "BRAF-targeted therapies" OR vemurafenib OR zebraf OR "BRAF inhibitor" OR braff OR dabrafenib OR trametinib OR "BRAF-targeted inhibition" OR "MEK inhibitor")
Scopus	(ALL ("Molecular Targeted Therapy" OR "Molecular Targeted Therapies" OR "Targeted Therapy, Molecular" OR "Therapy, Molecular Targeted" OR "Targeted Molecular Therapy" OR "Molecular Therapy, Targeted" OR "Targeted Molecular Therapies" OR "Therapy, Targeted Molecular" OR "targeted therapies" OR "targeted therapy" OR "therapeutic target" OR "personalized medicine" OR "Medicine, Precision" OR "Personalized Medicine" OR "Medicine, Personalized" OR "Individualized Medicine" OR "Medicine, Individualized" OR "P Health" OR p-health OR "Predictive Medicine" OR "Medicine, Predictive" OR theranostics OR theranostic OR "precision medicine" OR "BRAF/MEK targeting therapy" OR "MAPK-targeted therapies" OR "MAPK-targeted therapy" OR "BRAF-

	<p>targeted therapy" OR "BRAF-targeted therapies" OR vemurafenib OR plx4032 OR plx 4032 OR rg7204 OR rg-7204 OR "RG 7204" OR zelnorm OR r05185426 OR "BRAF inhibitor" OR braf OR dabrafenib OR "GSK 2118436" OR "GSK2118436" OR "GSK-2118436" OR trametinib OR "JTP 74057" OR "GSK 1120212" OR "BRAF-targeted inhibition" OR "MEK inhibitor" OR "U 0126" OR u0126) AND ALL ("odontogenic tumor" OR "odontogenic tumour" OR "Tumor, Odontogenic" OR "Tumors, Odontogenic" OR "Neoplasms, Dental Tissue" OR "Dental Tissue Neoplasms" OR "Dental Tissue Neoplasm" OR "Neoplasm, Dental Tissue" OR "Tissue Neoplasm, Dental" OR "Tissue Neoplasms, Dental" OR "odontogenic neoplasm" OR "Benign epithelial odontogenic tumours" OR "Benign epithelial odontogenic tumors" OR "Adenomatoid odontogenic tumour" OR "adenomatoid odontogenic tumor" OR "squamous odontogenic tumour" OR "squamous odontogenic tumor" OR "Calcifying epithelial odontogenic tumour" OR "Calcifying epithelial odontogenic tumor" OR ameloblastoma OR odontoma OR "Primordial odontogenic tumour" OR "Primordial odontogenic tumor" OR "Ameloblastic fibroma" OR "Dentinogenic ghost cell tumour" OR "Dentinogenic ghost cell tumor" OR "Odontogenic fibroma" OR cementoblastoma OR "Cemento-ossifying fibroma" OR "Odontogenic myxoma" OR "Malignant odontogenic tumours" OR "Malignant odontogenic tumor" OR "Sclerosing odontogenic carcinoma" OR "Ameloblastic carcinoma" OR "Clear cell odontogenic carcinoma" OR "Ghost cell odontogenic carcinoma" OR "Primary intraosseous carcinoma, NOS" OR "Odontogenic carcinosarcoma"))</p>
<p>Embase</p>	<p>(('molecular targeted therapy' OR 'molecular targeted therapies' OR 'targeted therapy, molecular' OR 'therapy, molecular targeted' OR 'targeted molecular therapy' OR 'molecular therapy, targeted' OR 'targeted molecular therapies' OR 'therapy, targeted molecular' OR 'targeted therapies' OR 'targeted therapy' OR 'therapeutic target' OR 'medicine, precision' OR 'personalized medicine' OR 'medicine, personalized' OR 'individualized medicine' OR 'medicine, individualized' OR 'p health' OR 'predictive medicine' OR 'medicine, predictive' OR theranostics OR theranostic OR 'precision medicine' OR 'braf/mek targeting therapy' OR 'mapk-targeted therapies' OR 'mapk-targeted therapy' OR 'braf-targeted therapy' OR 'braf-targeted therapies' OR vemurafenib OR plx4032 OR plx) AND 4032 OR rg7204 OR 'rg 7204' OR zelnorm OR r05185426 OR 'braf inhibitor' OR braf OR dabrafenib OR 'gsk 2118436' OR 'gsk2118436' OR 'gsk-2118436' OR trametinib OR 'jtp 74057' OR 'gsk 1120212' OR 'braf-targeted inhibition' OR 'mek inhibitor' OR 'u 0126' OR u0126) AND ('odontogenic tumor' OR 'odontogenic tumour' OR 'tumor,</p>

	<p>odontogenic' OR 'tumors, odontogenic' OR 'neoplasms, dental tissue' OR 'dental tissue neoplasms' OR 'dental tissue neoplasm' OR 'neoplasm, dental tissue' OR 'tissue neoplasm, dental' OR 'tissue neoplasms, dental' OR 'odontogenic neoplasm' OR 'benign epithelial odontogenic tumours' OR 'benign epithelial odontogenic tumors' OR 'adenomatoid odontogenic tumour' OR 'adenomatoid odontogenic tumor' OR 'squamous odontogenic tumour' OR 'squamous odontogenic tumor' OR 'calcifying epithelial odontogenic tumour' OR 'calcifying epithelial odontogenic tumor' OR ameloblastoma OR odontoma OR 'primordial odontogenic tumour' OR 'primordial odontogenic tumor' OR 'ameloblastic fibroma' OR 'dentinogenic ghost cell tumour' OR 'dentinogenic ghost cell tumor' OR 'odontogenic fibroma' OR cementoblastoma OR 'cemento-ossifying fibroma' OR 'odontogenic myxoma' OR 'malignant odontogenic tumours' OR 'malignant odontogenic tumor' OR 'sclerosing odontogenic carcinoma' OR 'ameloblastic carcinoma' OR 'clear cell odontogenic carcinoma' OR 'ghost cell odontogenic carcinoma' OR 'primary intraosseous carcinoma, nos' OR 'odontogenic carcinosarcoma')</p>
Grey literature	<p>("odontogenic tumor" OR "odontogenic tumour") AND ("Molecular Targeted Therapy" OR "Molecular Targeted Therapies" OR "targeted therapies" OR "targeted therapy" OR "Personalized Medicine")</p>

Supplementary File 2. Excluded articles after full text reading

1. Abe M, Zong L, Abe T, Hoshi K. A turning point in therapy for ameloblastomas. *Oral Oncol.* 2018 May;80:95-96. doi: 10.1016/j.oraloncology.2018.03.007.

Reason: Review letter

2. Abe M, Zong L, Abe T, Takeshima H, Ji J, Ushijima T, Hoshi K. BRAF inhibitor: a novel therapy for ameloblastoma in mandible. *Chin J Cancer Res.* 2018 Dec;30(6):677-678. doi: 10.21147/j.issn.1000-9604.2018.06.12.

Reason: Review letter

3. Bose P, Pleasance E, Jones M, Shen YQ, Ch'ng C, Reisle C, Schein JE, Mungall A, Moore R, Ma Y, Sheffield BS, Thomson T, Rasmussen S, Lee C, Yip S, Marra MA, Laskin J, Ho C, Jones SJM. Integrated genomic analysis of a recurrent ghost cell odontogenic carcinoma. *Clinical Cancer Research* 2016. Doi: 10.1158/1557-3265.pmsclingen15-pr02

Reason: Conference abstract

4. Fonseca FP, Monteiro Benites B, Soares CD, de Lima Morais TM, do Amaral-Silva GK, de Almeida OP, Soares FA, Fregnani ER. Prognostic importance of FGF2 and FGFR1 expression for patients affected by ameloblastoma. *J Oral Pathol Med.* 2018 Apr;47(4):417-424. doi: 10.1111/jop.12695.

Reason: The article did not treat.

5. Fregnani ER, Perez DE, Paes de Almeida O, Fonseca FP, Soares FA, Castro-Junior G, Alves FA. BRAF-V600E expression correlates with ameloblastoma aggressiveness. *Histopathology.* 2017 Feb;70(3):473-484. doi: 10.1111/his.13095.

Reason: The article did not treat.

6. Fujii S, Ishibashi T, Kokura M, Fujimoto T, Matsumoto S, Shidara S, Kurppa KJ, Pape J, Caton J, Morgan PR, Heikinheimo K, Kikuchi A, Jimi E, Kiyoshima T. RAF1-MEK/ERK pathway-dependent ARL4C expression promotes ameloblastoma cell proliferation and osteoclast formation. *J Pathol.* 2022 Jan;256(1):119-133. doi: 10.1002/path.5814.

Reason: The article did not treat.

7. Grynberg S, Steinberg Y, Asher N, Ben-betzalel G, Stoff R, Markel G, Shapira-Frommer R, Schachter J, Hirschhorn A. BRAF-targeted therapy for locally advanced ameloblastoma of the mandible: A potential neoadjuvant strategy. *Journal of Clinical Oncology* 2022 40:16_suppl, 3149-3149

Reason: Conference abstract

8. Hadi S, Porjo LA, Sandra F. Mechanism and Potential Therapy in Ameloblastoma: Akt Signaling Pathway. *Indonesian Biomedical Journal*, 2022.

Reason: Review article

9. Heikinheimo K, Kurppa KJ, Elenius K. Novel targets for the treatment of ameloblastoma. *J Dent Res.* 2015 Feb;94(2):237-40. doi: 10.1177/0022034514560373.

Reason: Review article

10. Ji YD, Keith DA. Clinical Trials of Rare Benign Pathologies in Oral and Maxillofacial Surgery. *J Oral Maxillofac Surg.* 2020 Jun;78(6):866-869. doi: 10.1016/j.joms.2020.01.040.

Reason: Review article

11. Kato S, Kurasaki K, Ikeda S, Kurzrock R. Rare Tumor Clinic: The University of California San Diego Moores Cancer Center Experience with a Precision Therapy

Approach. *Oncologist*. 2018 Feb;23(2):171-178. doi: 10.1634/theoncologist.2017-0199.

Reason: The article did not report the ameloblastoma treatment.

12. Kennedy WR, Werning JW, Kaye FJ, Mendenhall WM. Treatment of ameloblastoma and ameloblastic carcinoma with radiotherapy. *Eur Arch Otorhinolaryngol*. 2016 Oct;273(10):3293-7. doi: 10.1007/s00405-016-3899-3.

Reason: The article did not report the targeted therapy.

13. Kreppel M, Zöller J. Ameloblastoma-Clinical, radiological, and therapeutic findings. *Oral Dis*. 2018 Mar;24(1-2):63-66. doi: 10.1111/odi.12702.

Reason: Review article

14. Li S, Sun Y, Tian T, Qin X, Lin S, Zhang T, Zhang Q, Zhou M, Zhang X, Zhou Y, Zhao H, Zhu B, Cai X. MicroRNA-214-3p modified tetrahedral framework nucleic acids target survivin to induce tumour cell apoptosis. *Cell Prolif*. 2020 Jan;53(1):e12708. doi: 10.1111/cpr.12708.

Reason: Not studied odontogenic tumor

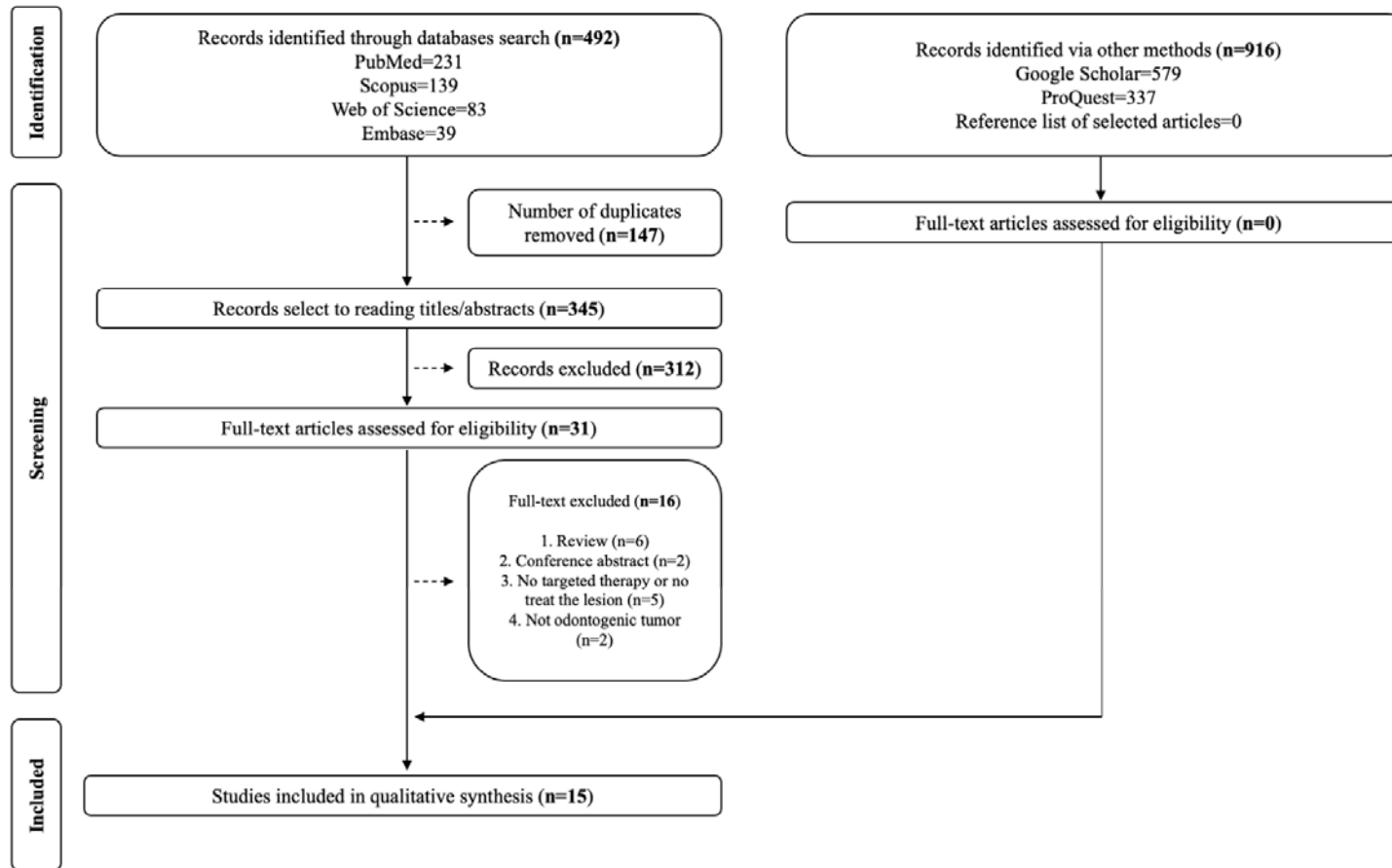
15. Salama AKS, Li S, Macrae ER, Park JI, Mitchell EP, Zwiebel JA, Chen HX, Gray RJ, McShane LM, Rubinstein LV, Patton D, Williams PM, Hamilton SR, Armstrong DK, Conley BA, Arteaga CL, Harris LN, O'Dwyer PJ, Chen AP, Flaherty KT. Dabrafenib and Trametinib in Patients With Tumors With BRAFV600E Mutations: Results of the NCI-MATCH Trial Subprotocol H. *J Clin Oncol*. 2020 Nov 20;38(33):3895-3904. doi: 10.1200/JCO.20.00762.

Reason: Not studied odontogenic tumor

16. Tarle M, Müller D, Tarle A, Blivajs I, Aljinović Ratković N, Knežević P. Challenges in the diagnostics and treatment of ectopic ameloblastic carcinoma: a case report. Croat Med J. 2020 Jul 5;61(3):271-275. doi: 10.3325/cmj.2020.61.271.

Reason: The article did not report the targeted therapy.

Supplementary File 3. Flowchart



Supplementary File 4. Critical appraisal

	Were patient's demographic characteristics clearly described?	Was the patient's history clearly described and presented as a timeline?	Was the current clinical condition of the patient on presentation clearly described?	Were diagnostic tests or methods and the results clearly described?	Was the intervention(s) or treatment procedure(s) clearly described?	Was the post-intervention clinical condition clearly described?	Were adverse events (harms) or unanticipated events identified and described?	Does the case report provide takeaway lessons?
Kaye et al., 2014	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tan et al., 2016	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Faden and Algazi, 2017	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Fernandes et al., 2018	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Broudic-Guibert et al., 2019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Brunet et al., 2019	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Weaver et al., 2020	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Cleary et al., 2021	No	Partial	Partial	Yes	Yes	Yes	Yes	Yes
Daws et al., 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hirschhorn et al., 2021	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Abramson et al., 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Damodaran et al., 2022	No	Partial	Yes	Yes	Yes	Yes	No	Yes
Lawson-Michod et al., 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Li et al., 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mathew et al., 2022	Yes	Yes	Partial	Yes	Yes	Yes	No	Yes