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Ectopic third molar in the mandibular jaw: Literature review

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Abstract
Purpose: To review the literature associated with ectopic third molar in the mandibular jaw.
Materials and Methods: A review of the literature was performed to record the Position of the ectopic tooth, patient's personal data, and Surgical choice.
Results: 32 articles were identified and reviewed in the presented study, ectopic third molars were generally located in the condylar region, Sigmoid notch, Coronoid region, ramus, Angulus. In our literature review showed more cases of ectopic third molars located in the condylar region than in the ramus or coronoid. There were higher prevalence in women and fourth decades of life were the most common time for this mishap to occur. Different methods of recovery were used.
Conclusion: The results of this review suggest that ectopic teeth must be removed if they cause symptoms. The surgical route should be designed according to the location and position of the third molar.

Keywords: Ectopic third molar, Sigmoid notch, cyst, Subcondylar, Condylar area, and Coronoid region

1. Introduction
Impaction of mandibular third molars is a common condition, with a frequency of 20%-30%, and a higher prevalence in women [1, 2]. In some cases the teeth tend to occupy an abnormal position because of lack of space in the posterior side of mandible. Third molar removal is one of the most common surgical procedures [3]. Unerupted third molars are normally found near the usual site of eruption. Sometimes, however, these teeth are found at places distant from their points of origin1. Ectopic positions include condyle ramus, coronoid process, sigmoid notch and lower border of angle of the mandible. Ectopic mandibular third molars are not very common and the etiology remains unclear [4].
Ectopic mandibular third molars, however, are unusual, with their heterotopic positions reported in the condylar area, in the ascending ramus of the mandible, or in the coronoid process. Most cases of ectopic third molars are asymptomatic and are usually found during routine clinical and radiographic investigations [5].

2. Materials and methods
Using a PubMed literature search, we identified and reviewed papers using these key words: Ectopic third molar, sigmoid notch, cyst, subcondylar, Condylar area, and Coronoid region.
Papers were retrieved from 1965 to 2016 and we recorded the Position of the ectopic tooth, patient's personal data, and Surgical choice. Papers in English were reviewed.

3. Results
Of 32 papers published on this topic between 1965 and 2015, we were able to retrieve and interpret all of them (Table 1). ectopic third molars were generally located in the condylar region, Sigmoid notch, Coronoid region, ramus, Angulus. In our literature review showed more cases of ectopic third molars located in the condylar region than in the ramus or coronoid. There were higher prevalence in women and fourth decades of life were the most common time for this mishap to occur. Different methods of recovery were used.

Table 1: Ectopic third molars in the literature.

Study reference	Age	Gender	Position of the tooth	Surgical choice
Traiger J. *et al* (1965) [6]	-	-	Sigmoid notch	-
Szerlip *et al* (1978) [7]	50	Female	subcondylar	Intraoral
Burton y Scheffer (1980) [8]	57	Female	Bilateral mandibular ramus	ıntraoral and extraoral
Srivastava y Singh (1982) [9]	40	Female	Condylar area	No treatment
Granite EL *et al* (1985) [10]	-	-	Subcondylar-sigmoid notch	Asymptomatic
Mehta DS *et al*. (1986) [11]	-	-	Sigmoid notch	-
Chongruk *et al* (1991) [12]	27	Female	Coronoid region	No treatment
Toranzo *et al* (1992) [13]	70	Female	Coronoid region	Intraoral
Bux *et al* (1994) [14]	66	Female	Subcondylar	Extraoral
Adams & Walton (1996) [15]	45	Female	Angulus	No treatment
Keros *et al* (1997) [16]	41	Male	Coronoid region	-
Medici *et al* (2001) [17]	41	Female	Condylar	Intraoral
Tumer *et al* (2002) [18]	47	Male	Subcondylar	Extraoral
Wassouf *et al* (2003) [19]	49	Female	Condylar	Intraoral
Suarez-Cunqueiro *et al* (2003) [20]	45	Male	Condylar	Intraoral
Salmeron *et al* (2008) [21]	42,53	Female, male	Condylar, subcondylar	Extraoral
Wang *et al* (2008) [22]	31	Female	Condylar	Intraoral
Kupferman & Schwartz (2008) [23]	49	Female	Ramus	Intraoral
Gadre et Waknis (2010) [24]	30	Female	Condylar	Intraoral
Bortoluzzi et Manfro (2010) [3]	68	Female	Condylar	Intraoral
Pace *et al* (2010) [25]	53	Male	Subcondylar	Extraoral
Procacci *et al* (2011) [26]	42	Female	Coronoid region	Intraoral
Kim (2011) [27]	70	Female	Condylar	No treatment
Shivashankara *et al* (2012) [2]	45	Male	Subcondylar	Extraoral
Iglesias-Martin *et al* (2012) [28]	53	Female	Subcondylar	Extraoral
Ahmed & Speculend (2012) [1]	38.52,36	Female, Female, Female	Angulus, Condylar, Ramus	Extraoral, Extraoral, Intraoral
Lambade *et al* (2013) [29]	35	Female	Condylar	Extraoral
Goel *et al* (2013) [30]	22	Male	Angulus	Intraoral
Bowman *et al* (2014) [31]	56	Male	Subcondylar	Extraoral
Kansy *et al* (2014) [32]	27	Female	Ramus	Intraoral
Fındık Y, Baykul T (2015) [5]	45	Male	Sigmoid notch	Intraoral
Apaydin A and Salahattin M (2015) [4]	38,25	Female	Ramus	Intraoral

4. Discussion

The etiology of ectopic teeth cannot be easily determined [33]. Several theories have been considered to explain ectopic locations such as trauma, ectopic formation of germs and aberrant eruption [21]. Impacted molars may be located at a distance from their normal location due to an aborted eruption, or displacement because of lesions (cyst or tumors) [4].

Diagnosis is based on clinical findings together with radiological assessment [3]. Whether third molars should be removed or not depends on the individual case. Ectopic third molars that are not symptomatic or associated with any disease do not require treatment. If they lead to symptoms, however, it is obvious that they should be removed [4, 8, 15, 16].

In the period 1965–2015, the most frequent location of ectopic molars was in the condyle [2, 3, 7, 9, 10, 14, 17, 19-25, 27-29, 31] (17 cases); 5 were in the ramus [8, 23, 1, 32, 4], with only 3 in the angulus [1, 15, 30], 4 in the coronoid [12, 13, 16, 26] and 4 in the sigmoid notch [4-6, 10, 11].

The choice of surgical approach is based on to the preference of the surgeon and the location of the tooth. All authors agree that treatment should be designed carefully with the aim of choosing the more conservative technique (in general, intra-oral access is performed whenever possible to avoid scars and nerve injury) [1, 3-5, 7, 8, 13, 17, 19, 20, 22-24, 26, 30, 32]. The use of an endoscope produces better visualization of the surgical field [20]. Where extra-oral access is required, the submandibular and retromandibular routs are most frequently used [1, 2, 8, 14, 18, 21, 25, 28-31]. The preauricular approach provides better vision of the condyle, but leaves a scar. The literature describes the use of an extra-oral approach when the molar is located in the condylar or sub condylar [2, 14, 18, 21, 25, 28, 31].

5. Conclusion

The results of this review suggest that ectopic teeth must be removed if they cause symptoms. The surgical route should be designed according to the location and position of the third molar.

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