Primary Intraosseous Carcinoma and Odontogenic Cyst.
Three new cases and review of the Literature

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ABSTRACT
Introduction: The Odontogenic Primary Intraosseous Carcinoma (PIOC) are a rare group of malignant tumours with strict clinic and anatomy pathological diagnosis criteria. The different classification suggested for these tumours and the small amount of cases described in literature makes it hard to know exactly how many of the cases published until now are real.

Material and Methods: We present three new cases of PIOC originated from a previous cystic lesion that where treated in our Hospital. Two of them in the posterior jaw region where is more frequent, and the third in the upper jaw.

We explain the procedure used in each case and the aesthetic-functional reconstruction used witches are two fibula osseomiocutaneous free flaps and a bone graft of iliac crest and further placing of implants. The classification, the clinical and radiological diagnosis, the treatment and its survival are discussed.

Results: in all three cases we were able to see in the anatomy pathological study an epithelial, exclusively without surrounding oral mucosa affectation or tissues near the lesion as well as the lack of tumorous pathology in other parts of the body. One of the patients died because of premature massive cervical recidiva while the other two patients are currently free form illness, for ten years one of them and fifteen months the other.

Conclusions: the anatomy pathological study of all of the lesions of cystic characteristics at jaw level is very important because of the risk of coexisting with carcinomatous cells. The treatment of these tumours consists in practising aggressive surgery and, in some cases, radio and/or chemotherapy post intervention.

Key words: Primary intraosseous carcinoma, odontogenic tumour, jaw cyst.

RESUMEN
Introducción: Los Carcinomas Intraosseos Primarios Odontogénicos (PIOC) son un raro grupo de tumores malignos con unos estrictos criterios diagnósticos clínicos y anatomo-patológicos. Las diferentes clasificaciones sugeridas para estos tumores y el escaso número de casos descritos en la literatura hacen difícil conocer con exactitud cuantos son los casos reales publicados hasta el día de hoy.

Material y Métodos: presentamos tres nuevos casos de PIOC originados a partir de una lesión quística previa que fueron...
tratados en nuestro centro. Dos en región posterior mandibular que es el lugar de más frecuente aparición, y un tercero en maxilar superior. Explicamos el tipo de cirugía llevado a cabo en cada caso y la reconstrucción estético-funcional utilizada que son dos injertos osteomiofasciales de peroné y un injerto de hueso de cresta ilíaca con posterior colocación de implantes. Se discute la clasificación, el diagnóstico clínico-radiológico, el tratamiento y su supervivencia.

Resultados: en los tres casos se pudo constatar en la anatomía patológica un epitelio celular bien diferenciado acompañando a células. carcinomatosas afectando al hueso exclusivamente sin afectación de la mucosa oral circundante ni de tejidos vecinos a la lesión así como ausencia de patología tumoral en otra zona del organismo. Uno de los pacientes falleció por recidiva cervical masiva precoz mientras que los otros dos están libres de enfermedad en la actualidad después de 10 años en uno de ellos y 15 meses en el otro.

Conclusiones: es muy importante el análisis anatomo-patológico de todas las lesiones de características quísticas a nivel maxilar por el riesgo de coexistir con células carcinomatosas. El tratamiento de estos tumores debe ser la práctica de una cirugía agresiva y, en algunos casos, asociados a radio y/o quimioterapia post intervención.

Palabras clave: Carcinoma intraosseo primario, tumor odontógeno, quiste maxilar.

INTRODUCTION

The odontogenic tumours create a wide and heterogenic group of tumours that include from benign forms to authentic carcinomas, these tumours are less than 4% of the neoplasia of the bucal and maxillofacial area and within this percentage, not more than 6% are considered malign (1), and in these cases the carcinoma will be predominated over the rest of malignant tumours extracted (2). It has been suggested that the origin to be in remains of epithelial odontogenic tissue (3, 4) (epithelial remains of Malasez) and they have been the subject of numerous taxonomic changes since their first classifications by OMS en 1971 when Pindborg called it Primary Intraosseous Odontogenic Carcinoma (3). This rare entity was described for the first time in 1913 by Loos (5) who defined the tumour as a “Central Maxillary Epidermoid Carcinoma”. In the past there have been several authors that have studied the number of cases encountered since its first description and in which stands out the presentation by Eversole and Col. (6) of 36 revised cases.

Due to the difficulty of the diagnosis of this rare tumoral entity the number of published cases in literature up to this day and classified as Primary Intraosseous Squamous Carcinoma is not uniform, fluctuating between twenty- four (7) and thirty- nine cases (8). In the following article we present three clinical cases of Primary Intraosseous Carcinoma that were originated from an Odontogenic Cyst and were collected between 1994 and 2003 at our Hospital Center with the intention of adding more data about this infrequent tumoral pathology and its treatment, and at the same time performing an extensive bibliography revision of what has been published of the tumoural entity up to this day.

CLINICAL CASE 1

A forty nine year old male patient was sent to us after having an extraction of his third molar included in the right mandible side ((Fig. 1) performed a curettage of a tissue of granulation at apical level and distal of the exodontied piece. As far as interesting personal history the only outstanding features were a smoking habit of 35 packs/year and 150g/day of alcohol. As far as his family history what stands out is the death of his father caused by colon cancer. The symptoms of physical exploration were of pain and swelling in the region of the forty eighth piece of several months of evolution that did not improve after the exodontia of such piece and also presenting in the lower right vestibular side a swelling of bone consistency and a strictly normal mucosa.

After analyzing the extracted tissue during the exodontia of the forty-eighth piece by the pathology department is informed as an Squamous cell Carcinoma with well differentiated cells. A extended clinical and radiological study is performed at head and neck level, where a destructive osteolytic lesion is found in the computerized tomography affecting the body and branch of the jaw and also the right sided multiple cervical lymphadenopathies at all levels, at abdominal-thoracic level no pathological image at distance is evident being normal the blood test and without any alteration of its parameters.

The case is discussed in the Head and Neck Functional Unit (HNFU) of our center being catalogued as a T2N2bM0 and a radical surgical treatment is decided with a radio therapeutic HNFU) of our center being catalogued as a T2N2bM0 and a radical surgical treatment is decided with a radio therapeutic treatment by isocentric technique of three fields and concomitant chemotherapy.

A hemimandibulectomy is performed from the forty third piece to the right subcondilar region, radical modified cervical neck dissection, tracheostomy and reconstruction with osteomiofascia free fibular flap (Fig. 2). The histological study catalogs the piece as a Keratinizing Squamous Cell Carcinoma and affecting twenty three of the thirty-five extracted lymph nodes, with extra capsular invasion of such nodes classifying them as pT2pN2b.

After three and a half months of the surgical intervention a recidive is diagnose after performing a new cervical CT-Scan that showed cervical nodes compatible with massive recidive in the form of multiple bilateral adenopathies. The possibility of performing a new chemotherapy cycle is discussed but it is eliminated due to the fast massive recidive, the lack of response to the treatment and the low level of tolerance to the chemotherapy on the patients side. The patient was accepted to palliative care unit and died six and a half months after the surgical intervention by local-regional massive recidive.
Primary Intraosseous Carcinoma

Fig. 1. Radiolucent image inside the mandible ramus in the orthopantomography after removal of right third molar.

Fig. 2. Control Orthopantomography after the operation where we can see the fibula free flap fix with titanium miniplates in the subcondyle and in the anterior mandible region, we also can see the intermaxillar blockadge.

Fig. 3. Left third molar in mesial angulation on a radiolucent image in an orthopantomography previous to left third molar removal.

Fig. 4. CT-Scan of neoplastic lesion showing the bone marrow infiltration and the hyperinsuflation of the left body mandibular cortical bone.

Fig. 5. Anatomy pathological study of the lesion that shows atypical cells with hyperchromatic nucleus with deeply penetrating and well differentiate cells in the surface.

Fig. 6. Postoperation Orthopantomography that shows the fibula microvascularised free flap osteosynthesis with titanium miniplates in the left subcondyle region and in the left side of anterior mandible region.
A fifty-one year old female patient without any medical history interest comes to us referred by another hospital center for an exodontia of the thirty eighth piece included in the mesioversion with a suspicious image of a follicular cyst (Fig. 3). At the exploration the patient presents a bone consistency with swelling by vestibular region in the left side of the jaw without affection of the oral mucosa.

The histological analysis of tissue of granulation extracted with the piece is reported as atipical cells compatible with Squamous Cell Carcinoma with well differentiated cells on the surface (Fig. 4). At cervical level a submandibular lymphadenopathy can be detected on the left side not been specified because of years of evolution without malignant clinical characteristics.

A computerized tomography (Fig. 5) that informs of an infiltrative lesion by Positron Emission Tomography that does not evidenciate the presence of cervical nodes or in the rest of the organism suggesting tumoral dissemination.

The case is discussed in the HNFU being decided a surgical treatment and concomitant radiotherapy. The pre-operative tests (blood test, ekg, and chest x-ray) do not show any alteration. A hemimandibulectomy is performed from the thirty fourth piece to the left subcondilar region with a Functional Head and Neck dissection of four cervical nodes levels, tracheostomy and reconstruction with osteomycutaneous free fibular flap (Fig. 6). The pathology study reports of Squamous Cell Carcinoma with well differentiated cells and no invaded nodes by neoplastic cells of the twenty three nodes extracted being classified as pT2pN0 and chronic inflammatory process at the level of a submandibular lymphadenopathy. In the two check-ups performed up to fifteen months after, the patient is free of sickness.

An eighteen year old male patient without pathological background of interest comes to us referred by his odontologist after the extraction of the canine of the first quadrant included without any previous symptomatology to the one that was extracted with the piece a follicular cyst that was sent for study to the pathology department which informed of the presence of maligns Squamous Cells with Well Differentiated Cells. In the exploration no ulceration of the oral mucosa was present but a fistula was found at the level of vestibular side of the first quadrant that does not drain any material at the moment of exploration. In the orthopantomography an osteolysis image was visible in the anterior region of the first quadrant. In the physical exploration or in the CT scan no cervical lymphadenopathies were present.

The case is discussed in the Oncological Committee of our center where it is decided to practice a maxillectomy from the eleven piece to the sixteenth and reconstruction with free non vascularized graft of bone from the iliac crest. The patient follows six month check-ups the first five years being free of sickness time in which four implants are placed to position an implant supported prosthesis to this day the patient has been ten years free of tumoral sickness.

CLINICAL CASE 2

CLINICAL CASE 3

DISCUSSION

No agreement exist as far as the most frequent age and sex of this pathology even though it is believed that the relation man/woman is around a 2/1 and the fifth and sixth decades of life (9) as age slot more frequent for its appearance.

Pindborg and Col. (3) in the reunion at the OMS celebrated in Geneva in 1971, revisioned in 1992 by Kramer and Col.(4) named Primary Intraosseous Carcinoma the tumoral entity that is characteristic for affecting specifically the bone at the moment of diagnosis for which it has to be discarded the possibility of an extension from neighbouring soft tissues, paranasal sinus, metastasic lesions…. According to these classification of the OMS the carcinoma odontogenic go by the following classification:

1. Malignant Ameloblastoma.
2. Primary Intraosseous Carcinoma.
3. Other Carcinomas that originated from the Odontogenic Epithelium also including those originated from a Odontogenic Cyst.

This classification was modified in several occasions, in 1982 by Elzay (10) and afterwards in 1984 by Slootweg and Muller (11) suggesting the following classification for the odontogenic carcinomas:

1. Primary Intraosseous Carcinoma Ex-Odontogenic Cyst
2. a. Malignant Ameloblastoma.
   b. Ameloblastic Carcinoma: from a Ameloblastoma, a Odontogenic Cyst or de novo.
3. Primary Intraosseous Carcinoma: a) Keratinizing
   b) No Keratinizing

In both classification the primary intraosseous carcinoma appeared de novo without a previous lesion that justifies it, it is discussed even though in the second classification exposed is mentioned as its own entity; this brings the need to demonstrate in the anatomopathologic study the presence of a benign cystic epithelium of Well Differentiated Cells along with Carcinomaous Cells to have a definite diagnosis of Primary Intraosseous Ex-Odontogenic Cyst (8) since clinically it can only be suspected after an exploration generally marked by a tumours fact of inflammatory characteristics without affection of the oral mucosa and also with radiological images of radiolucent lesion that provokes an osteolysis in the form of an atypic cystic lesion, entering in the differential diagnosis, the ameloblastoma and the Keratocyst among others (7,10).

As far as the cases we presented, the first two are similar in localization but not as far as cervical dissemination, that is because in case number 2 we perform a prophylactic neck dissection of four levels while in the case number 1 the nodes affection forces us to perform a modified radical neck dissection respecting the spinal nerve, the internal jugular vein and Sternocleidomastoideus muscle. The size of the tumour in the cases 1 and 2 obliged to perform a highly mutilating surgery to preserve the appropriate oncological security margins. The osteomycutaneous free microvascular graft of fibula allows to reconstruct three-dimensionally the hemimandible after the tumoral exeresis maintaining the functionality and the esthetical profile especially in those cases who are candidates for
We consider of great importance to perform an anatomopa-
thetic study of all the lesions with cystic appearance or
existing lesion (13). Any how all parts agree that the aggressive
surgery that will allow to obtain some acceptable functional and
esthetic results being the osteomyocutaneous microvascu-
ized free fibula flap a good reconstructive option because of
its length and low mortality for the cases that affect mandibular
posterior region.

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