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ORIGINAL ARTICLE

Clinical characteristics of malignant tumours originating in the external ear☆

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Non-melanoma skin cancer;
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Abstract
Background: Skin tumours that originate in the external ear are common in individuals with type 1 skin and phenotype 1 and 2. The skin cancer is associated with chronic or intermittent, but intense sunlight. The most common malignant tumour is basal cell carcinoma, followed by squamous cell carcinoma and melanoma. The diagnosis of squamous cell skin cancer in head and neck area is usually made in the advanced stages and has a poor prognosis.
Material and methods: A cross-sectional, retrospective analysis was performed on the database of patients with skin cancer of the external ear treated between 2011 and 2014. Histology type, stage, rate of clinical and occult metastases, and rate of loco-regional recurrence were evaluated.
Results: Of the 42 patients included there were, 25 squamous cell carcinomas, 11 basal cell carcinomas, and 6 invasive melanomas. The rate of lymph node metastases in patients with squamous cell carcinoma was 32%, mostly in the parotid and peri-parotid region, 7% of them with capsular rupture, 2/17 were staged as cN0, and 11.7% had occult metastases. All patients with nodal metastasis were classified as T2 with ulceration.
None of the patients with basal cell carcinoma had lymph node metastases.
All melanomas were superficial extension type with mean level of Breslow of 3 mm. All underwent lymphatic mapping and sentinel node biopsy, with only one having metastases in the sentinel node.

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Conclusion: The most frequent tumour in the external ear in this series was squamous cell carcinoma. The possibility of lymph node metastases is associated with tumour size (T). Node dissection should be systematic in patients with T2 or greater.

PALABRAS CLAVE
Cáncer de piel no melanoma;
Oreja;
Carcinoma epidermoide;
Carcinoma basocelular

Características clínicas de los tumores malignos originados en el pabellón auricular

Resumen
Antecedentes: Los tumores cutáneos que se originan en el pabellón auricular son frecuentes en individuos con piel tipo 1 y fenotipos 1 y 2; estos están asociados a la insolación crónica o intermitente, pero intensa. El tumor maligno más frecuente es el carcinoma basocelular, seguido del epidermoide y del melanoma. Suelen diagnosticarse en etapas tardías y tener mal pronóstico.
Material y métodos: Estudio transversal, con análisis retrospectivo de la base de datos de pacientes con cáncer de piel, que fueron tratados entre 2011 y 2014. Se incluyen los pacientes con tumor en el pabellón auricular. Se evaluó: tipo histológico, etapa, tasa de metástasis clínicas y ocultas, y tasa de recurrencia locorregional.
Resultados: Incluimos 42 pacientes con 25 carcinomas epidermoides, 11 basocelulares y 6 melanomas invasores. La tasa de metástasis ganglionares en pacientes con carcinoma epidermoide fue 32%, la mayoría en la parótida y la región periparotídea; 7% con rotura capsular, 2/17 se etapificaron como cN0, tuvieron metástasis ocultas (11.7%). Todos los pacientes cN+ fueron clasificados como T2, con ulceración. Ninguno de los pacientes con carcinoma basocelular tuvo metástasis ganglionares.
Todos los melanomas fueron de tipo de extensión superficial, con media de Breslow de 3 mm, y a todos se les realizó mapeo linfático y biopsia del ganglio centinela; solo uno tuvo metástasis en el ganglio centinela.
Conclusión: El tumor más frecuente en el pabellón auricular en la presente serie es el carcinoma epidermoide; la posibilidad de metástasis ganglionares se asocia al tamaño del tumor (T), la disección ganglionar debe de ser sistemática en pacientes con T2 o mayores.

Background

Skin cancer is the most common tumour in the economy,[1] although its prevalence is often under-recorded. This is because many cases are resolved as outpatients and are not reported, and because many of these tumours, since they are not a cause of mortality are not duly registered. Furthermore, most epidemiological studies when referring to skin cancer only include skin melanomas, and not basal cell carcinomas, squamous cell carcinomas or carcinomas of skin annexes.[2]

WHO reports that basal cell cancer is the most common of the skin cancers, followed by squamous cell carcinoma, and melanoma. Carcinomas of skin annexes are less common.

In Mexico,[2,3] 16,000 new cases of skin cancer are recorded every year, with an estimated prevalence of 13.6%, and it ranks fifth amongst all body tumours.

Seventy percent of skin cancers are located in the head and neck area, 80% of these are basal cell carcinomas. The most common site is the facial region; there is a specific area known as the ''mask area'', which comprises the periorbital, peribuccal, nasal, perinasal and auricular regions. Tumours arising in this area are considered high risk, since they have a poor prognosis compared with tumours which originate in other areas of the face, the scalp and outside the head and neck. Tumours originating in the mask area present greater rates of local recurrence, probably because the excision margins are difficult, as they are in areas where organs important for function hinder their removal. Furthermore, squamous cell carcinomas arising in these sites are usually accompanied by a large percentage of lymph node metastases which are palpable or occult at the time of diagnosis, and which have a negative impact on the prognosis for these patients. The incidence of lymph node metastases is greater in patients with squamous cell carcinomas arising in the mask area, compared with other sites, both inside and outside the cervico-facial area.[4,5]

The external ear is included in the mask area, and therefore neoplasias arising from the external ear have been reported as having a poor prognosis, with high temporal infiltration of the tumour or infiltration of the auditory canal, with lymph node metastases principally in the parotid gland, the periparotid region, and the high levels of the neck (IIA, IIB and VA).[1]

The major cause of skin cancer is immoderate exposure to the sun, and is more common in individuals with pale skin, eyes and hair (phenotype 1).[6]

Other risk factors have been identified such as: immunosuppression[7] (patients with chronic kidney failure or under treatment with immunosuppressants), human papilloma virus, oncogenetic alterations (PTCH1 mutation in basal cell carcinoma, and mutations in the p53 tumour suppressor gene in squamous cell carcinoma) and chronically inflamed or irritated skin areas.[8–10] However, the sun is the most significant risk factor; intense and acute exposure is associated with basal cell carcinoma, and intermittent but chronic exposure is associated with squamous cell carcinoma, and cutaneous melanoma.

The most significant prognostic factors in skin cancer are: histological type, tumour size, stage of the disease, location (prognosis is poorer in the mask area), histological grade and neuroinvasion.[11,12]

Carcinomas arising in the ear area, due to their location, are considered to be more aggressive and to have a poorer prognosis when compared to those located on the extremities or the trunk.[1] They are also associated with a greater frequency of lymph node metastases, both occult and clinical, when they are diagnosed, and these can be parotid or periparotid, and can spread locally to the ear canal and the mastoid region.[13–15] Lymph node metastases predominate in patients with bulky tumours (T2 and T3) when they ulcerate, when the Breslow's thickness is greater than 4 mm, and when there is ear cartilage infiltration. A tumour with these features can present lymph node metastases, although these are not evident at the time of diagnosis, and therefore it is considered that they are all an indication for lymph node dissection of the risk area, even if the patient does not have palpable lymph nodes (cNO).[15,16]

The *objective* of this study was to discover the clinical features of patients with skin cancer arising in the ear, the rate of lymph node metastases, and locoregional recurrence.

Material and methods

This was a cross-sectional, retrospective study of our department's database of patients with skin cancer located in the ear, and who were treated over 3 years, between 1 January 2011 and 1 January 2013.

All patients with skin cancer arising in the external ear were included. Patients with preneoplastic lesions, and lentigo maligna melanoma were excluded from the study.

All the patients underwent diagnostic and staging biopsy at the time of consultation, and were evaluated with high-resolution ultrasound of the neck, and the parotid and periparotid region on the same side as the lesion, if lymph node metastases had not been palpated at the time of evaluation.

Before the procedure, all the patients underwent a cardiovascular assessment in order to rule out underlying disease, which would increase the therapeutic risk.

We assessed the histology, stage, and presence of lymph node metastasis at the time of diagnosis, the incidence of occult metastasis in patients with no metastasis found on palpation or on ultrasound imaging, in patients undergoing lymph node dissection, and the treatment given.

Results

Forty-two patients were identified with tumours arising in the external ear, 14 women and 28 men with a mean age of 70, and with a range of 29–94 years of age.

Thirty-two patients had received no treatment whatsoever, and 10 had recurrent tumours after previous treatment which they had received outside our hospital.

Histology

Twenty-five were diagnosed as invasive squamous cell carcinomas, 11 basal cell carcinomas, and 6 melanomas.

At the time of diagnosis, 32% (8 patients) of the 25 patients with squamous cell carcinoma had lymph node metastasis, all located in the periparotid region (buccinator and masticator lymph nodes), the parotid region and levels IIA and IIB; in 17 patients no lymph node metastases were found on palpation or ultrasound imaging, at the time of diagnosis (cN0), all underwent lymph node dissection and 2 were classified as pN+ (11.7%), both patients had pT2 stage tumours, which were ulcerated, infiltrating the ear cartilage; the metastases in both were located in the periparotid lymph nodes.

The incidence of lymph node metastasis in patients with squamous cell carcinoma, both clinical and occult, was 43%, and lymph node capsule rupture was found in 7%.

Of the 11 patients with basal cell carcinoma, 7 were solid and 4 morphea in type; none of them had palpable lymph node metastasis in the parotid or cervical region, and they underwent wide resection of the lesion only.

One of these female patients had a history of recurrence after radiotherapy and required wide en bloc resection with the mastoid apophysis. This patient presented a second massive local recurrence in the temporal region 8 months after rescue surgery, and was a candidate for palliative treatment only.

In the 6 patients with cutaneous melanoma, the mean Breslow's thickness was 3 mm. They all had superficial spreading melanoma, the 6 presented ulceration and mitotic index more than one mitotis per mm^2, 2 were classified as pT2B, and 4 as pT3B.

Treatment

Squamous cell carcinoma

All the patients underwent full resection of the lesion, and lymph node dissection of the risk area. If there were lymph node metastases which were palpable or detected on ultrasound imaging, a parotidectomy, dissection of the buccinator and masticatory glands, and modified radical neck dissection type 3, including levels I–V, were performed.

In patients with no clinical metastases, or metastases detected by imaging, the lymph nodes were staged by lymphatic mapping with sentinel node biopsy in 7 patients, and by elective parotid and cervical dissection in 10.

Of the 7 patients who underwent mapping, only one (14%) had metastasis in the sentinel node located in the periparotid region, and surgery was completed with parotidectomy and lymph node dissection. No further metastatic nodes were found in the specimen from this patient.

Of the 10 cN0 patients who underwent elective dissection (parotidectomy and neck dissection), only one (10%) had a lymph node metastasis in the intraparotid region.

None of the patients were given combined adjuvant chemoradiotherapy, but the patients with more than 3 metastatic lymph nodes received radiotherapy on the site of the primary in the neck.

Basal cell carcinoma

All the patients underwent wide resection of the ear, with postoperative evaluation of the section margins to ensure that there was no tumour infiltration. None of the patients underwent lymph node dissection; one of them underwent mastoid resection with preservation of the facial nerve due to infiltration into the temporal petrous bone. The section margins were negative in all of the patients.

Cutaneous melanoma

All the patients were staged as cN0 at the time of diagnosis (with no palpable lymph nodes), and all of them underwent wide resection and lymphatic mapping with sentinel node biopsy using the combined technique (radio-colloid and patent blue V dye). Only one patient (16%) presented metastasis in the sentinel node, no metastases were detected in the sentinel node in 5 patients. The patient with the metastatic sentinel node underwent parotidectomy and lymph node dissection, the dissected lymph nodes in this procedure had no metastases. None of the patients received adjuvant therapy.

Local control

Only one patient out of 11 (9%) presented local recurrence after resection. This patient had a morphea carcinoma, with mastoid infiltration, and had previously undergone local radiotherapy. The neoplasm was progressive, and this patient was a candidate for palliative treatment only.

For the patients with squamous cell carcinoma the control rate was 68%, the locoregional tumour recurrence rate was 32%. Only one patient of the 8 with recurrence was able to undergo rescue surgery. The carcinoma progressed in the rest, and they died from the disease during follow-up.

The 6 patients with cutaneous melanoma have presented no recurrence in a mean follow-up of 2 years.

Discussion

The most frequent tumour in this series is squamous cell carcinoma, followed by basal cell carcinoma, and melanoma. The majority of these patients presented in advanced locoregional stages or with adverse prognostic factors (ulceration and cartilage infiltration), which explains their outcomes.

Squamous cell carcinoma arising in the skin of the external ear has a poor prognosis due to the stage at which it is usually diagnosed, and the presence of lymph node metastases which are both clinically evident and occult.[15]

The tumour size and the lymph node status are the most important prognostic factors, and have a directly proportional relationship with local recurrence and survival.

In this series, 32% of patients with squamous cell carcinoma had palpable lymph node metastasis at the time of diagnosis, 7% of them had lymph node capsule rupture, which is an adverse prognostic factor that is likely to result in locoregional recurrence.

The patients presenting no evidence of palpable metastasis (11%) had occult metastasis which became evident at the time of surgical lymph node staging, either by sentinel node biopsy or elective dissection. This percentage justifies undertaking surgical staging in patients with advanced stages (T2 or greater) or who have adverse prognostic factors.[17]

Level IIB was infiltrated in the 8 patients with lymph node metastases (32%) in this series, therefore this level should be included in therapeutic neck dissection, although the morbidity risk associated with dysfunction of cranial nerve XI is greater. However, the possibility of surgical rescue in the event of recurrence in this site is unlikely due to the possibility of infiltration into the deep musculature of the neck and the prevertebral fascia.

Lymphadenectomy should include the parotid region, the periparotid lymph nodes, and levels I to V of the neck without resection of the lymph node structures.[1]

Lymphatic mapping with sentinel node biopsy is a lymph node staging alternative to neck dissection and parotidectomy. It enables patients with occult metastases to be detected with the same degree of certainty as lymph node dissection, but without the risk that this implies, especially in terms of the surgical morbidity of cranial nerve VII. Although it cannot yet be considered the standard treatment, it might be useful in patients who have been staged as cN0 clinically, and by imaging, and those who have adverse risk factors.[17,18]

In basal cell carcinoma there is no indication for lymph node resection due to the low incidence of regional metastases. However, it is important to obtain negative section margins, since this is the most significant risk factor for local recurrence. Controlling these lesions with radiotherapy is questionable when the tumour is bulky; therefore treatment with surgery is advocated initially.

In cutaneous melanoma, the most significant prognostic factors are the mitotic index, the presence of ulceration, and, above all, Breslow's thickness. In patients with a Breslow's thickness of 1 mm or greater, lymph node staging is indicated, and the best method for this is lymphatic mapping with sentinel node biopsy using the technique that gives the fewest false negatives, and the highest identification rate, which is the combined technique. This involves the injection of dye the night before surgery, and 10 min before surgery, and requires lymphogammagraphy to identify the precise site of lymphatic drainage, and to locate the first node relay (sentinel node).

Lymphatic mapping is considered the standard procedure for the staging and treatment of cutaneous melanoma, and although there is still debate as to the how to behave

if metastases are found, the current recommendation is to complete the lymph node dissection. With the neoplasm which concerns us here, this involves performing a parotidectomy, and neck dissection. This series showed a rate of metastasis in the sentinel node similar to that reported by other authors (10–20%), and this fully justifies undertaking the procedure.[19]

Conclusion

The 2 most common neoplasms which arise in the skin of the ear are basal cell carcinoma and squamous cell carcinoma. The site in itself indicates a poor prognosis, and therefore a firm diagnosis and early treatment are necessary. Lymph node staging in patients with no palpable regional metastases but with adverse factors, in the case of squamous cell carcinoma, should be routine, and modified radical neck dissection should include the 5 lymph node levels, and the parotid region, if there are palpable metastases at the time of diagnosis.

Conflict of interest

The authors have no conflict of interest to declare.

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