CASE REPORT

Follicular dendritic cell sarcoma presenting as a painless lump in the parotid

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SUMMARY

Follicular dendritic cell sarcoma (FDCS) is a rare neoplasm of the antigen presenting cells of the immune system. The majority occur in lymph nodes but around 30% can occur extranodally including in the spleen, lungs, head and neck and liver. We present an unusual case of an FDCS of the parotid gland in a 51-year-old woman with a history of Hodgkin's lymphoma treated with combination chemotherapy and modified mantle radiotherapy. Only four cases of an intraparotid FDCS have been previously reported. The patient underwent a superficial parotidectomy and level 2/3 neck dissection. A diagnosis of an intraparotid FDCS (25 mm) with no nodal disease was made. Given this patient's history of radiotherapy 20 years previously, we speculate the possibility of postradiation sarcoma.

BACKGROUND

Follicular dendritic cells are stromal cells of the humoral immune system found in primary follicles, and germinal centres of secondary lymphoid organs. They play a vital role in antigen storage and B cell activation.¹ Follicular dendritic cells are characterised by CD21 and CD35 surface expression.² Follicular dendritic cell sarcoma (FDCS) is a rare neoplasm of these cells, classified under the histiocytic and dendritic cell neoplasms in the WHO classification of tumours.³ These tumours can occur intranodally and extranodally. Less than one-third of these neoplasms occur extranodally and these sites include the tonsil, gastrointestinal tract, thyroid, spleen and larynx.⁴⁻⁸ Histologically, these tumours can be difficult to diagnose, as the

Figure 2 Preoperative axial Short TI Inversion Recovery (STIR) MRI.

morphological spectrum is broad and often causes a degree of histological confusion. Due to the rarity of these extranodal tumours, the literature regarding them is limited to case reports and case series, therefore, evidence regarding treatment is limited. We present an extremely rare case of an FDCS of the parotid gland that occurred 20 years postradiotherapy treatment. To our knowledge, this is the first case of FDCS postirradiation.

CASE PRESENTATION

A 51-year-old woman presented with a lump in the right parotid which had been present for over 3 months. She had a background of Hodgkin's lymphoma over 20 years previously which was treated with modified mantle radiotherapy (35 Gy) and combination chemotherapy (ChlVVP X1, ABVD X3). She did not complain of any other head and neck symptoms, and there were no B symptoms (fever, night sweats, weight loss). This was investigated with a PET CT (Positron Emission Tomography-Computed Tomography) which showed increased avidity in the right parotid tail, but no evidence of diffuse disease (figure 1).

Figure 1 Fused axial PET CT.

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Figure 3 Preoperative coronal STIR MRI.

A core biopsy was performed under ultrasound guidance, which initially suggested a poorly differentiated tumour with features suggestive of high-grade lymphoma. Further immunostaining took place and was weakly positive for p63 and H&E sections showed some desmosomes. It was concluded that the

Figure 4 Superficial parotidectomy specimen: low power view showing a well-circumscribed nodule.

Figure 5 Strong positive staining for follicular dendritic cells marker CD21.

appearances were contrary to the initial findings and consistent with a poorly differentiated squamous cell carcinoma.

Following this, she underwent an MRI of the neck (figures 2 and 3) and CT scan of the neck and chest, both of which only identified the aforementioned right parotid tail tumour. She was treated as an unknown primary squamous cell carcinoma and underwent an upper aerodigestive tract endoscopy, tongue base mucosectomy and right superficial parotidectomy with levels II and III neck dissections. Intraoperatively the marginal mandibular and buccal branches required sharp dissection from the tumour for preservation and therefore the margins were close. Postoperatively, she recovered well with no evidence of facial nerve palsy.

The parotid sample measured at 50×25×20mm with an intraparotid tumour measuring 25mm with atypical cells, predominantly spindle cells, arranged in a storiform and whorled pattern (figure 4). The tumour cells were positive for CD21 (figure 5) and focally positive for CD23 (figure 6) and CD68. They were negative for CD45, p63, SMA, ER, PR, AE13, CD1a, S100 and Cam 5.2. The morphology in the immunoprofile suggested that this was an FDCS. There was no metastatic disease.

Figure 6 Strong positive staining for follicular dendritic cells marker CD23.

Figure 7 Postoperative axial STIR MRI.

Her records from previous mantle radiotherapy were unobtainable due to the time that had passed. Her disease was in the lower cervical chain and mantle radiotherapy given would have covered the upper cervical chain with an inevitable degree of overlap of the tail of parotid. As there was no evidence of residual disease on her postoperative MRI scan (figures 7 and 8), it was felt that the benefits of adjuvant treatment did not outweigh the risks of long-term side effects.

OUTCOME AND FOLLOW-UP

She remains under regular follow-up with interim imaging, 7 months post-treatment the patient remains disease free.

DISCUSSION

First described by Monda *et al*, with a study of four cases, FDCS is a rare neoplasm.⁹ The most recent large review done by Li *et al* reported that there have been approximately only 137 cases documented in the head and neck region.¹⁰ The majority of head and neck cases occur in the cervical lymph nodes, extranodal sites include palatine tonsil and nasopharynx. FDCS of the parotid as reported in this case is extremely rare with only four cases previously reported in the literature.^{11–14}

The reporting pathologist (SDP) has an expertise in salivary gland pathology which helped to identify that the features present in the surgical specimen did not meet the criteria for any primary tumour of salivary gland origin listed in the most recent WHO classification of head and neck tumours.¹⁵ Given the rarity of FDCS, the histological diagnosis can be difficult if not impossible without immunohistochemistry for follicular dendritic cell markers such as CD21 and CD23. In addition, negative staining

for (1) broad-spectrum keratins (AE1/AE3, CAM 5.2), (2) protein S100, a marker of melanocytic lineage, (3) common leucocyte antigen (CD45) have been helpful to exclude carcinoma, melanoma and lymphoma. Smooth muscle actin immunostaining was negative in the tumour cells, thus excluding the possibility of leiomyosarcoma. Additional markers such as p63, ER, PR were performed to exclude metastatic malignancies. Negative staining for p63, in combination with negativity for keratins was used to exclude squamous cell carcinoma. Lack of staining for ER and PR did not support gynaecological and breast primary site of origin. The final diagnosis was delayed and guided by the immunohistochemical results, but this is not surprising as up to 50% of FDCS cases are initially misdiagnosed.¹⁵

Review of the literature suggests that FDCS has a slight male predominance and the median age of diagnosis is 40 (age 9–86).¹⁶ There have been seven reported paediatric cases of FDCS of the head and neck. These mostly occurred intranodally or from the soft-tissues of the neck but two cases occurred extranodally in the oral cavity.¹⁷ Although it was previously thought that this was an indolent disease, recent reports suggest it has a recurrence rate of >20% and a metastatic rate of 21%.¹⁸ The features suggestive of a poorer prognosis include young age, absence of lymphoplasmacytic response, tumour size >6 cm and high mitotic count (>5 per field).¹⁹

Management of FDCS is similar to other soft-tissue sarcomas, with surgical resection being the mainstay of

Figure 8 Postoperative coronal STIR MRI.

treatment. Additionally, there is no consensus regarding neck dissection for FDSC of the head and neck. The literature suggests that patients with primary disease in the neck and patients with regional metastases should be considered for a neck dissection as the recurrence rate is significant.¹⁰ There is no evidence to suggest that adjuvant radiotherapy or chemotherapy adds any benefit to treatment although radiotherapy is recommended for cases with close resection margins. A recent pooled series compared patients who received surgical resection alone against those who received surgical resection with adjuvant radiotherapy. Their findings demonstrated radiotherapy reduced the rate of recurrence, but much larger studies are needed to confirm this.²⁰

In the case that we have reported the decision was made not to add radiotherapy to the treatment despite there being close margins. Given that she has received previous radiotherapy to the neck, there would be considerable overlap, which may limit the dose of radiotherapy that could be delivered and therefore reduce its efficacy. If the full recommended dose for adjuvant radiotherapy for sarcomas (50–60 Gy)²¹ were given, this would increase the risk of long-term toxicity with regards to radionecrosis of the jaw and neuropathy. Currently, this patient is being closely monitored with radiotherapy in reserve for any local recurrences.

This is the first recorded case of a FDSC in an area that has been previously irradiated and fulfils the criteria to be defined as a radiation-induced sarcoma (RIS): treatment with therapeutic irradiation at least 3 years prior to development of sarcoma, arises within the field of previous irradiation and differing histology between the sarcoma and primary tumour.²² In a retrospective review carried out of patients with RIS, the interval from irradiation to development of RIS was 3–36 years (median 11 years).²³ Very little is known about the pathogenesis of these diseases and we can only speculate that this is radiation induced.

Learning points

- Follicular dendritic cell sarcoma (FDSC) is rarely found in the head and neck and in particular the parotid. They have distinctive histological features, and by raising awareness it should hopefully encourage pathologists to consider it in their differentials. Diagnosis can then be confirmed with immunohistochemistry staining.
- Surgical resection remains the best treatment for these tumours, but the multidisciplinary team should consider adjuvant treatment particularly if factors are present that suggest a poorer prognosis.
- Much more research is needed in to help us understand the behaviour and treatment responses of FDSC of the head and neck.
- It is also important that clinicians are aware of the potential development of radiation-induced sarcoma which can occur many years after radiotherapy.

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in patient management and final editing of the article. SDP was involved in the diagnosis of the patient and histopathological contribution to the article.

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