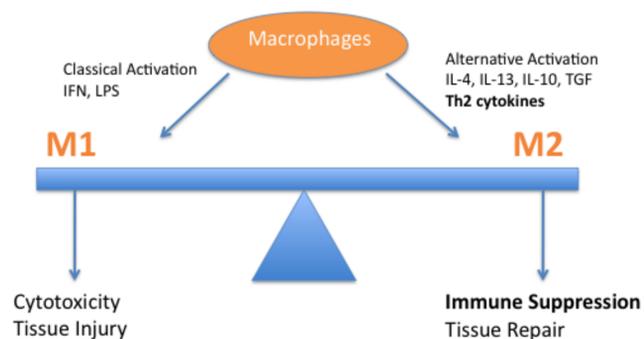


Introduction

Tumor-associated macrophages (TAMs) are macrophages that infiltrate tumor tissues and are well-known contributors to tumor progression.¹ TAMs possess a predominant macrophage 2 (M2) phenotype indicative of local immune suppression.^{1,2} The CD163 protein is expressed on the surface of monocytes and macrophages and is an immunohistochemical marker for M2 macrophages.³ We describe a patient with a unique clinical presentation of a single focus of metastatic prostate cancer in the head and neck and further investigate the M2 differentiation of the draining cervical lymph nodes.

Adaptive Immunity

Th1 and Th2 differentiation drives the immune microenvironment



M= Macrophage Differentiation

Figure 1. Diagram illustrating adaptive immune system and Th1/Th2 differentiation in the immune microenvironment.

Materials and Methods

CD 163 staining was performed on a benign draining level 3 lymph node, a level 4 lymph node with a focus of metastatic prostate cancer and the primary laryngeal tumor. We compared this to a cervical lymph node of different cancer-free patients with benign reactive lymph nodes. Sections 4 μm thick from formalin fixed paraffin embedded (FFPE) tissue were placed on positively charged slides, dried overnight at 65°C and then stained with the primary antibody CD163 (MRQ-26 clone, Cell Marque, Rocklin, CA) on an automated platform (Ventana, Tucson AZ).

Patient

A 59-year-old male with recurrent T4 N0 SCC of the larynx with synchronous prostate adenocarcinoma was referred to our clinic. His prostate adenocarcinoma was confined to the prostate and regional pelvic lymph nodes, without any known distant metastatic disease. Physical examination showed no evidence of neck disease and pre-operative computed tomography (CT) imaging of the head and neck showed no other evidence of disease. The patient underwent salvage total laryngectomy and bilateral neck dissection with final pathology revealing a recurrent moderately differentiated SCC involving the larynx as well as metastatic prostate cancer in draining level 4 cervical lymph nodes bilaterally.

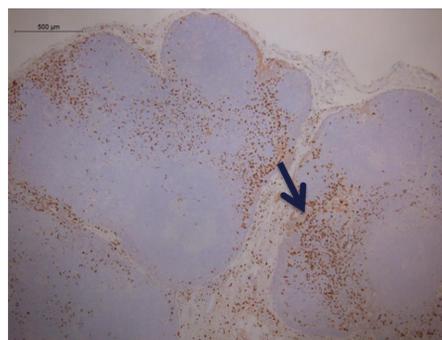


Figure 2. Reactive lymph node

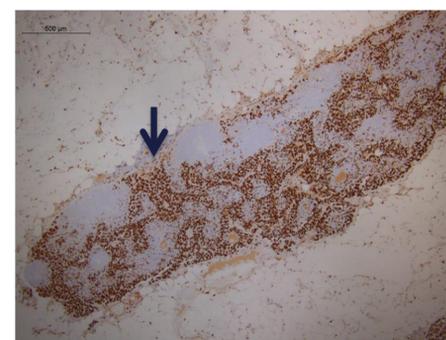


Figure 3. Negative lymph node

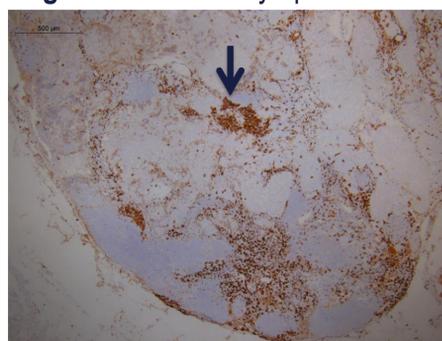


Figure 4. Positive lymph node

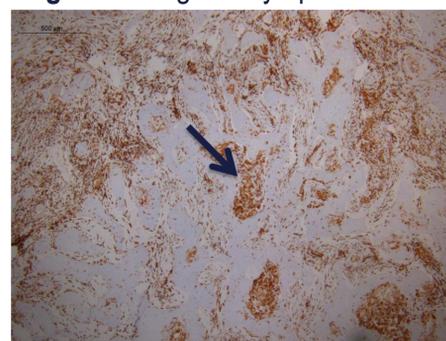


Figure 5. Primary tumor

CD163 staining performed on FFPE tissue: benign reactive lymph node from cancer free patient (Figure 2); benign draining level 3 lymph node (Figure 3); level 4 lymph node with metastatic prostate cancer (Figure 4); primary laryngeal tumor (SCC) (Figure 5).

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Discussion

Descriptive pattern of staining for CD163 demonstrated a paucity of M2 differentiation in benign non-draining lymph nodes of cancer free patients (Figure 2). Conversely the benign draining lymph node in the SCC patient demonstrated a large CD163 population of cells (Figure 3) as did the interface of the prostate cancer and surrounding lymph node (Figure 4). Additionally the macrophage differentiation at the primary tumor in the larynx was strongly CD163 positive supporting an immune permissive environment (Figure 5). The incidence of cervical lymph node involvement in patients with prostate cancer has been reported as 0.4% or less and these patients usually present with widespread metastatic disease.⁴ Our patient had no other foci of metastatic disease with contained disease in the prostate and pelvic lymph nodes. Additionally, serum from this patient did not reveal any circulating prostate tumor cells (Cell Tracks Analysis).

Conclusions

- We describe a unique case of metastatic prostate cancer to the cervical lymph nodes in the setting of laryngeal cancer
- The increase in CD163 positive (M2) macrophages suggests that SCC may be able to skew the local immune microenvironment in draining lymph nodes
- Lymph nodes that are “primed” by squamous carcinoma to M2 phenotype may be permissive to harboring metastases from other primary tumors

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