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An early twentieth-century case of lower lip cancer from the Morgagni Museum (Padua, Italy)

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Summary This case report presents a new interpretation of the autopsy of a man who died in 1915, based on a noninvasive macroscopic analysis of the remains combined with a review of historical and recent literature on the association of pipe smoking with lower lip cancer. The autopsy reported severe cachexia, a large ulcerated neoplastic mass on the lower lip, and characteristic dental wear suggesting habitual pipe smoking. Given historical evidence linking pipe smoking to lower lip cancer, this case aligns with documented instances of tobacco-induced oral malignancies. The study highlights the significance of curated pathological collections in revisiting medical diagnoses and understanding historical disease progression, contributing to the broader discourse.

Keywords Anatomical preparation · History of medicine · Dental wear · Tobacco consumption · Paleopathology

Introduction

The Morgagni Museum of Human Anatomy of the University of Padua (Italy) hosts more than 1300 pathological specimens dating from the late eighteenth century to the mid-twentieth century. These specimens, preserved either in liquid or dry [1, 2],

provide valuable insight into historical medical conditions and autopsy findings. Among them are two specimens that belong to the same individual, a 38-year-old man who died in Padua in 1915. One is his head, presenting a case of lower lip cancer (Fig. 1a), and the other displays the gray hepatization of the right lung (Fig. 1b). The necropsy diagnosis states: “Cancer of the lower lip. Gray hepatization of the upper lobe of the right lung.”

Dated March 2, 1915, the autopsy reported a “severe cachectic individual. The entire chin and lower lip are covered by a very large whitish neoplastic mass, which is soft and ulcerated in some areas.” However, the report does not indicate whether the tumor was analyzed or sampled to determine its specific type. It further notes that the heart was flaccid, cloudy, fatty, and some areas showed a striped (tigered) pattern. Both lungs had adhesions, with a gray hepatization of the right lung’s upper lobe. The spleen was soft and approximately twice its normal size, with a pale and slightly hyperplastic pulp. The liver and kidneys showed fatty degeneration. The patient died while hospitalized in the Male Surgery Clinic in Padua, but data do not indicate the reason for his admission nor the cause of death.

Materials and methods

A recent restoration and noninvasive analysis of the head at the Morgagni Museum has provided further insights into the possible cause of the development of this tumoral mass. Distinctive wear was observed on the occlusal surfaces of all second premolars (maxillary and mandibular, left and right; Fig. 2). The significant wear patterns suggest extra-masticatory activity, potentially linked to habitual pipe smoking (Fig. 3; [3]). The fungating lower lip mass, combined with dis-

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Fig. 1 **a** Head of the individual showing lower lip cancer. **b** Hepatization of the lung from the same individual. (© Giovanni Magno—University of Padua)

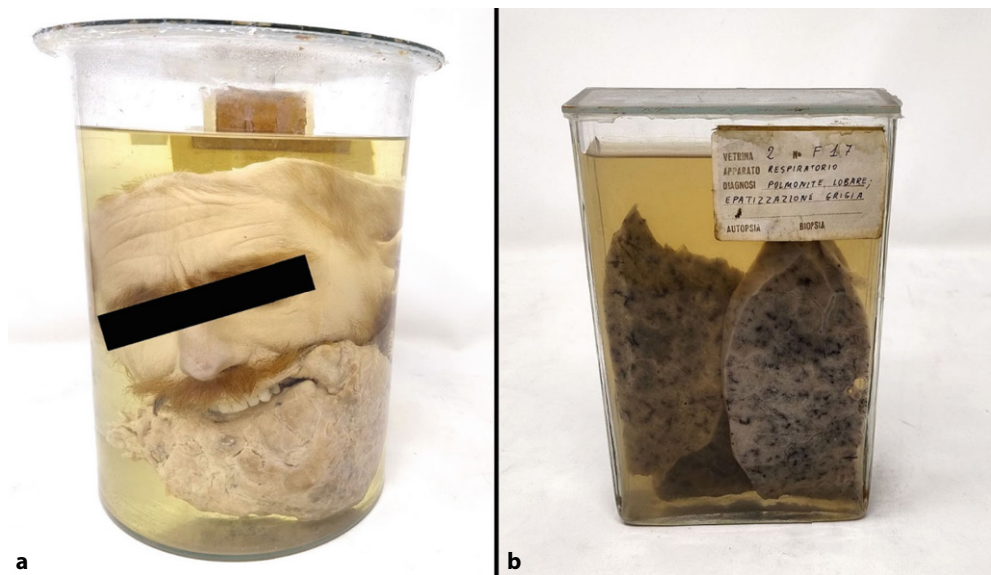
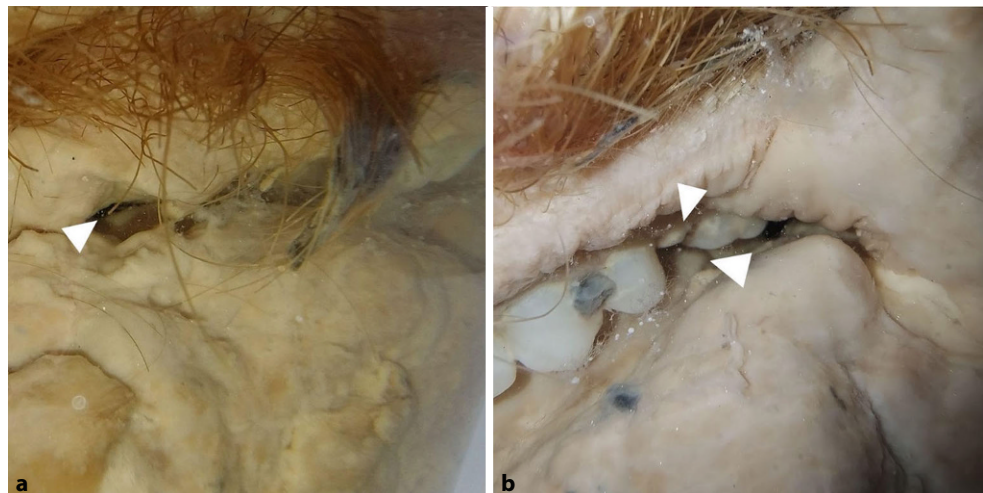


Fig. 2 **a** Right side of the mouth showing circular tissue impression and dental wear (arrowhead) on the second lower premolar and second upper premolar (covered by cancerous tissue). **b** Left side of the mouth showing dental wear on the second upper and lower premolars (arrowheads). (© Giovanni Magno—University of Padua)



tinctive dental wear, aligns with historical and recent reports associating chronic pipe use with oral cancer.

Since the popularization of tobacco in the seventeenth century and up until the popularization of cigarettes in the late nineteenth century, pipe smoking had been the most common means of tobacco consumption. Macroscopic analyses of skeletal remains from the modern era have confirmed higher rates of tobacco-related markers, including pipe notches and dental staining [4]. The first documented clinical link between pipe smoking and lower lip cancer was recorded in 1795 [5], with further studies in the nineteenth century reinforcing this connection. In 1885, Greco explored this relationship in attempting to explain why the lower lip is more frequently affected by cancer than other parts of the body [6], maintaining that prolonged contact with the hot pipe stem could cause epithelioma development. This aligns with more recent literature on the effects of tooth wear and heat damage from pipe smoking [7] as well as damage to the soft tissues [8]. He also suggested that

dental wear from pipe clenching may cause chronic trauma due to the sharp edges of the worn tooth repeatedly irritating the lower lip, potentially leading to epithelioma formation.

In 1915, Cavaglieri discussed X-ray therapy for epithelioma of the lower and upper lip, exploring the effectiveness of radiotherapy in treating lip cancer. He argued that superficial and slow-growing tumors responded well to X-ray treatment, often leading to significant improvement or remission. By contrast, deep-seated and lymphatically invasive tumors only experience temporary relief before progression. Cavaglieri's study demonstrates an understanding of the relevant literature on this emerging technique and highlights the success of highly penetrating and filtered X-ray applications. Despite some positive outcomes, the study ultimately concludes that surgical intervention remains the best treatment option for most patients with advanced lip cancer.

Among Cavaglieri's case studies, one involved a 47-year-old pipe smoker who, despite suffering from

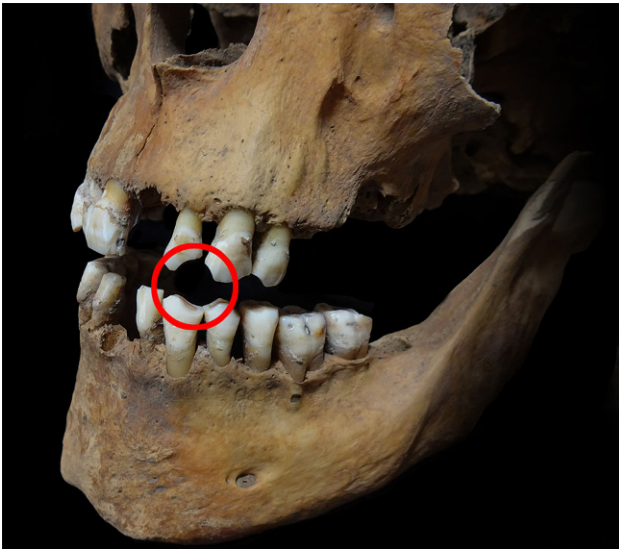


Fig. 3 Archaeological example of a notch in the dentition caused by habitual smoking of a clay pipe. Adapted from Casna et al. (2024, Fig. 2). (Licensed for use by CC BY 4.0)

a persistent ulcerating lesion on his lower lip, reportedly continued smoking. His condition initially improved with X-ray therapy, but later worsened, spreading to regional lymph nodes, ultimately necessitating surgical removal. A second case of a 52-year-old pipe smoker presented with a lower lip lesion that had persisted for 4 years but worsened in the previous 6 months. The ulcerated surface, previously treated with silver nitrate cauterizations, had grown larger, developing thick, sharply cut edges and producing bloody secretions with severe pain. Despite refusing surgery, he consented to a preliminary scraping procedure followed by X-ray therapy, which was successful in the following 2 months. At the 5-month follow-up, no recurrence was observed, suggesting a successful outcome [9].

Results and discussion

The autopsy findings, combined with historical medical literature, suggest that the 38-year-old man in the Morgagni Museum died from complications of advanced lower lip cancer, potentially caused by habitual pipe smoking. The distinctive dental wear further supports this conclusion, as it matches documented cases of pipe smoking-related dental wear [3]. Contemporary epidemiological research demonstrates that while cigarette smoking carries the greatest overall health burden, pipe and cigar use are also associated with significantly elevated risks for oral, lip, and lung cancers compared to non-smokers [10, 11]. Most recently, a large cohort study reported that exclusive pipe smokers had more than a twofold increase in mortality from tobacco-related cancers, albeit lower than the rates observed among cigarette smokers [10]. Although the precise magnitude of lip cancer risk as-

sociated with these products remains somewhat uncertain, prolonged exposure to tobacco juice, heat, and chemical irritants from pipe/cigar use is highly likely to contribute substantially to oral cancer development, particularly with repeated or prolonged contact with the lips, gums, and teeth [12].

The preservation and recent re-examination of this case have allowed us to revise and enrich the original autopsy report, providing new evidence of dental wear and potential extra-masticatory activity linked to habitual pipe smoking. This further supports the historical connection between pipe smoking and lower lip cancer, reinforcing the conclusions drawn by early medical pioneers. It remains unclear whether the patient was about to receive treatment at the time of death, as cancer therapies were still experimental in 1915. Given that X-ray therapy was emerging as a novel approach and that surgical intervention was still the primary curative option, it is possible that the patient succumbed to the disease before any treatment could be administered. This ambiguity highlights the medical limitations of the time and underscores the importance of continued research in the historical evolution of oncological therapies. Nonetheless, the study is limited by the availability of historical documentation and the scope of the literature reviewed—factors that may introduce biases. Acknowledging these constraints provides important context for the interpretation of the findings.

Take-home message

- The Morgagni Museum preserves over 1300 pathological specimens, including two from the same individual showing lower lip cancer and gray lung hepaticization.
- Autopsy findings and pipe-associated dental wear suggest a strong link between habitual pipe smoking and oral cancer in this case.
- The study reinterprets historical autopsy data through noninvasive macroscopic analysis and updated literature review.
- It reinforces the documented association between tobacco use and lower lip malignancies.
- Pathological museum collections are valuable resources for revisiting diagnoses and understanding the historical context of disease.

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Conflict of interest A. Cusan, M. Casna and G. Magno declare that they have no competing interests.

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