

CASE REPORT

Two Teflon granulomas of the nasopharynx and paravertebral space mimicking a neoplasm

Frederieke Kamp  | Claudio Storck 

Hals-Nasen-Ohren-Klinik,
Universitätsspital Basel, Basel,
Switzerland

Correspondence

Frederieke Kamp, Hals-Nasen-
Ohren-Klinik, Universitätsspital
Basel, Petersgraben 4, CH-4031 Basel,
Switzerland.
Email: frederiekekamp@gmail.com

Abstract

Teflon has been proved to be able to extravasate and infiltrate into soft tissue to form an inflammatory giant-cell foreign-body reaction, a so-called Teflon granuloma. We present a rare case report of a patient with two Teflon granulomas of the head and neck, who were first interpreted as a neoplasm.

KEYWORDS

nasopharynx, Teflon, Teflon granuloma, velopharyngeal insufficiency

1 | INTRODUCTION

Teflon paste is a suspension of polymerized tetrafluoroethylene in glycerine.¹ After an injection with Teflon, it induces a localized foreign-body reaction walled off by surrounding fibrosis.^{2,3} It was considered useful because it is a stable, inert synthetic polymer, the body does not resorb it and it was thought not to migrate over time. For these characteristics, it has been used for tissue augmentation in different surgical areas.⁴⁻⁷ In otolaryngology, Teflon injections were commonly used to treat diseases like vocal fold paralysis, velopharyngeal insufficiency, or very seldom as a treatment for a patulous Eustachian tube. Since the early 1990s, the use of Teflon injections declined rapidly because of the publication of several case reports, in which was described that the injection with Teflon resulted into extravasation and infiltration of the surrounding soft tissue producing Teflon-induced granulomas.^{8,9} Today, Teflon is primarily used in the neurosurgical field to enable tumor dissection and to establish microvascular decompression for example in the case of hemifacial spasm.¹⁰⁻¹⁴ Granulomas often simulate a neoplasm, which makes it clinically and radiographically difficult to differentiate between the two conditions. We present a patient with two Teflon granulomas of the nasopharynx and

paravertebral space, which were initially interpreted as a neoplasm.

2 | CASE REPORT

A 73-year-old female patient was presented at our outward clinic after she had undergone a contrast-enhanced CT scan of the head and neck, which was performed as a diagnostic work-up for dementia clarification. As an incidental finding, the CT scan demonstrated two ill-defined, contrast-enhancing masses with small central calcifications, extending from the skull of the base cranially to the vertebral body of C2 caudally (Figure 1A,B): The first mass was situated in the left nasopharynx, measuring 3.1×2.4×5.1 cm. The second mass showed adjacent on the left in the paravertebral space and measured 5×3.6×3.3 cm in size. The masses both demonstrated infiltrative osseous growth with osteolysis of the ventral and left atlas (Figure 1C). The patient herself did not have any complaints, especially no pain, no difficulties swallowing, and no symptoms of possible cancer. Her medical history revealed an adenotonsillectomy as a child. Physical examination findings showed a protruding submucosal mass of the posterior naso- and oropharyngeal wall on the

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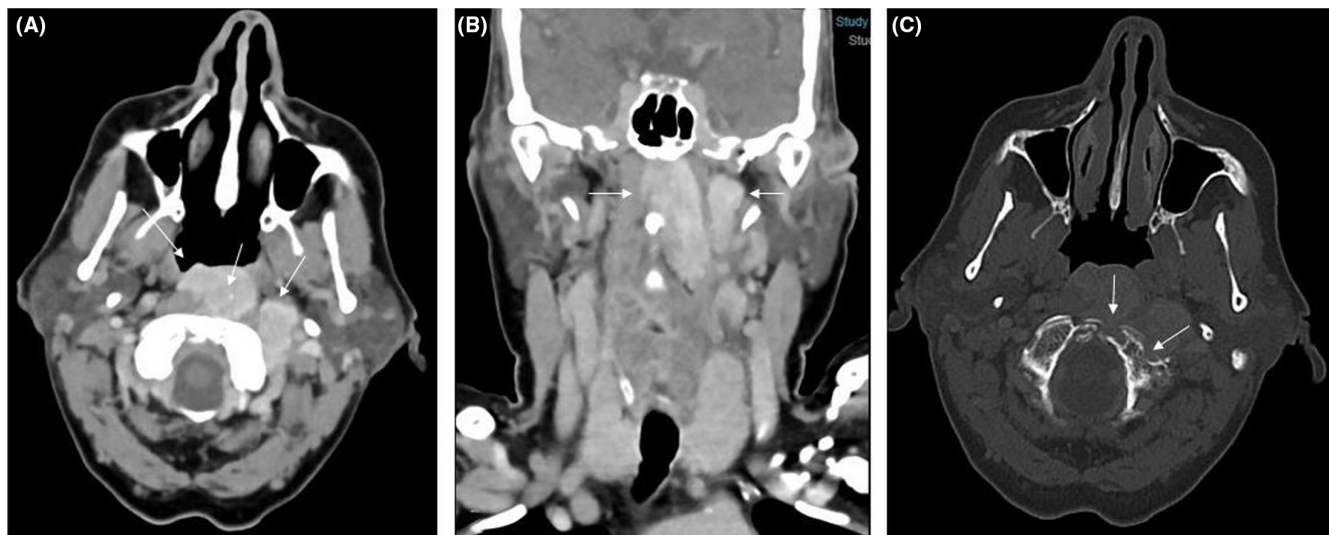


FIGURE 1 (A). Contrast-enhanced axial CT scan demonstrates two ill-defined masses of the left-sided nasopharynx and paravertebral space (arrows). The masses show central calcifications (arrow). (B). Coronal reconstruction of the same CT scan shows the extension of the masses (arrows). (C). Axial CT scan without contrast-enhancement which demonstrates centrally and left-sided osseous infiltration of the Atlas (arrows)

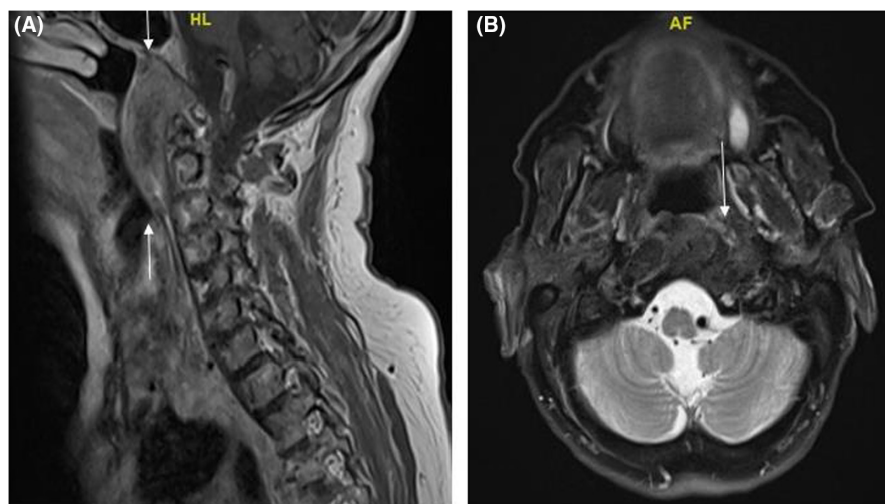


FIGURE 2 (A). Postcontrast saggital T1-weighted image showing the cranial and caudal extension of the mass from the skull base cranially to the vertebral body of C2 caudally, with low signal intensity (arrows). (B). Postcontrast axial T2-weighted image showing a low signal intensity and infiltration of the surrounding soft tissue (arrow)

left side; the mucosa surface itself was smooth. Facial and trigeminal nerve function, vocal cord, and tongue mobility were normal.

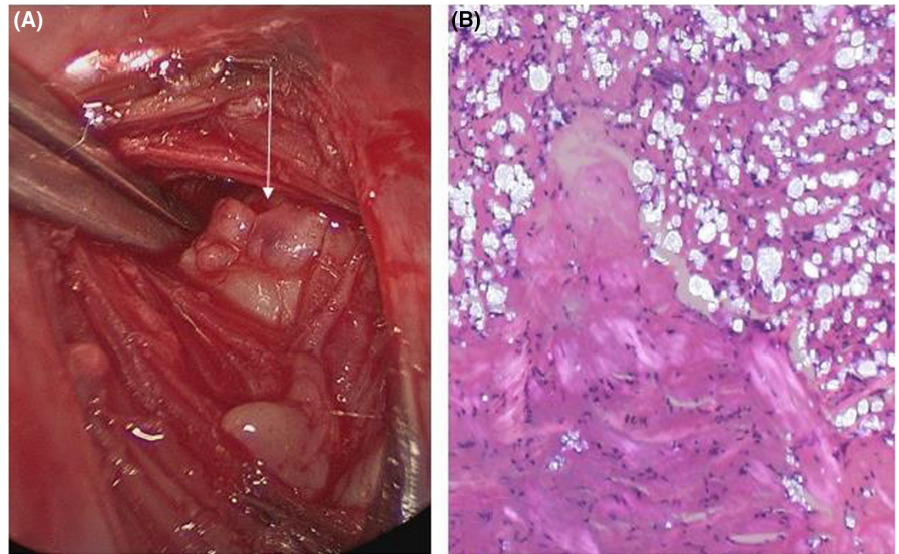
For further diagnostic work-up of the surrounding soft tissues, a contrast-enhanced MRI scan of the head and neck was performed. Both masses demonstrated only a weak T1- and T2-weighted signal intensity. The surrounding soft tissues and muscles were infiltrated (Figure 2A,B).

Based on radiographic findings, we suspected a malignancy of the sarcomatous type, a desmoid tumor, or a chronic inflammation of unclear etiology. The T2-weighted hypointense presentation made a chondrosarcoma, chordoma, or lymphoma unlikely.

For further specification in terms of the genesis of the tumor, a pharyngoscopy with biopsy of the tumor was indicated. Intraoperatively, after incising the mucosa of the left-sided nasopharynx, a submucosal granulomatous and calcified lesion was noted. There was no indication of infection such as pus or necrosis (Figure 3A). We took several biopsies. Postoperative histopathological analysis revealed an accumulation of partly giant-cell phagocytized exogenous foreign material, which corresponds to so-called Teflon material (Figure 3B).

Since the patient was asymptomatic, we decided in accordance with the current literature, on a non-invasive treatment with regular radiographic follow-up. In the last check-up after 6 months, the patient was still symptomless.

FIGURE 3 (A). Intraoperatively, after incising the mucosa of the left-sided nasopharynx, a submucosal granulomatous and calcified lesion was noted (arrow). (B). Histopathological image of the neck mass entirely composed of a foreign-body giant cell reaction (Hematoxylin–eosin stain; magnification x 59)



The radiological examination by means of MRI of the head and neck showed a stable situation without further tumor progression.

3 | DISCUSSION

We present a case of a patient with two large Teflon granulomas of the left-sided nasopharynx and paravertebral space, who was initially suspected to have a neoplasm based on CT finding. To our knowledge, a case in which a patient has two granulomas at the same time has never been described in the literature. There is only one slightly similar publication to be found: Harrigal et al. presented two cases of Teflon granuloma of the pharynx, who both developed after having a cleft palate repair with Teflon implant for velopharyngeal insufficiency.¹⁵ The etiology of the Teflon granuloma of our patient remains unclear. According to our clinical evaluation, the patient has beginning dementia, and she herself could not remember any intervention with an injection of Teflon material, which is a limitation of this case report. Nevertheless, based on the histopathological picture, in combination with the clinical findings (circumscribed painless lesion in typical location), the diagnosis of a Teflon granuloma can be made. The most important differential diagnosis could be “carried over” Teflon material into a pre-existing lymph node in the case of status after Teflon injection. However, all histologically expected features of a lymph node fail, so that this differential diagnosis can be rejected. Given the site of the Teflon granuloma, we hypothesize that she had an epipharyngeal Teflon implant augmentation as a treatment for velopharyngeal insufficiency (VPI). Although most VPI occurs in children with a cleft palate, it has also been described as a

risk factor after adenotonsillectomy.¹⁶ This could be the case with our patient, who underwent an adenotonsillectomy as a child. However, VPI after adenotonsillectomy is uncommon with an incidence being said to be between 1:1200 and 1:3000.

Teflon was discovered in 1938 by a chemist named Roy J. Plunkett.⁵ Because of its strength and good flexibility, it's supposed biological stability and low soft tissue reactivity, Ludington and Woodward first used it in medicine as a prosthetic material in the abdominal wall.⁴ In Otolaryngology, Arnold firstly applied Teflon in 1962 for vocal cord medialization.⁷ Over the following decades, it was utilized on several sides in the head and neck. Already in 1967, Toomey et al described the occurrence of Teflon injections in the vocal cord to cause granulomas.⁹ Thereafter, the incidence of adverse effects including granulomas has been estimated to be around 2%–3%.¹⁷ They may occur immediately or many years after injection. As a consequence, the use of Teflon declined almost completely during the 1990's.

Because of the decline in the use of Teflon and because of its low incidence, Teflon granulomas remain a rare phenomenon. Knowledge of the patient's prior surgical history is essential to suspect the diagnosis. Radiographically, especially with CT, the diagnosis of a Teflon granuloma is often difficult to establish as it mimics an infectious or malignant process.^{15,18–20} The latter three reports suggest to perform a MRI for further differentiation. As the chronic fibrosis of a Teflon granuloma only induces a low to intermediate T2-weighted signal intensity, a carcinoma is associated with a high T2-weighted signal intensity. This was in accordance with the radiographic results of our patient. But because of the characteristically hyperdense Teflon deposits on CT, we suggest to combine CT with MRI scanning in the diagnostic process of a Teflon granuloma.

Information on the management of a Teflon granuloma is primarily published in the neurosurgical literature, since Teflon injections are still performed in that field. Deep et al. reported that since there has been no known malignant transformation of a Teflon granuloma, in asymptomatic patients a wait-and-see policy with regular radiographic follow-up is appropriate. If, however, the patient develops progressive symptoms or the differentiation with a neoplasm is not clear, resection of the Teflon granuloma is indicated.²¹

4 | CONCLUSION

We reported a case of two Teflon granulomas of the nasopharynx and paravertebral space. Clinically and radiographically, these granulomas can simulate a neoplasm, which makes it difficult to differentiate between the two conditions. In the absence of a comprehensive clinical history, as in the case presented herein, combining CT and MRI scanning may be recommended. The combination of a low T1- and T2-signal intensity of the MRI and the presence of calcified Teflon deposits on the CT scan may indicate the diagnosis of a Teflon granuloma.

AUTHOR CONTRIBUTIONS

Frederieke Kamp: Conceptualization; data curation; methodology; resources; writing – original draft; writing – review and editing. **Claudio Storck:** Conceptualization; resources; supervision; validation; writing – review and editing.

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There are no acknowledgements.

CONFLICT OF INTERESTS

There is no conflict of interests.

DATA AVAILABILITY STATEMENT

All data underlying the results are available as part of the article and no additional source data are required.

STATEMENT OF THE ETHICS COMMITTEE NORTHWEST AND CENTRAL SWITZERLAND (EKNZ)

The research project does not fall under the scope of the Human Research Act, because it is not defined as a research project as per HRA Art. 2. An authorization from the ethics committee is therefore not required.

CONSENT

The patient gave her informed consent to use her record data for research purposes.

PERMISSION TO REPRODUCE MATERIAL FROM OTHER SOURCES

There was no reproduction of material from other sources, so permission to do so was not needed.

ORCID

Frederieke Kamp  <https://orcid.org/0000-0003-0971-2859>

[org/0000-0003-0971-2859](https://orcid.org/0000-0003-0971-2859)

Claudio Storck  <https://orcid.org/0000-0003-2187-8181>

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