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(CASE REPORT)

A rare case of deep lobe parotid pleomorphic adenoma featuring parapharyngeal extension: Clinical, radiological and surgical implications: A case study

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Abstract

Background: Tumors arising from the deep lobe of the parotid gland with extension into the parapharyngeal space (PPS) are rare and often present without an external cervical mass. This atypical presentation may delay diagnosis and complicate surgical management. Pleomorphic adenoma, although the most common benign salivary gland tumor, infrequently involves the deep lobe with parapharyngeal extension.

Case Presentation: A 52-year-old woman presented with a 7-month history of progressive oropharyngeal fullness and mild dysphagia, without neck swelling or facial nerve dysfunction. Clinical examination revealed a bulge of the right lateral pharyngeal wall. High-resolution magnetic resonance imaging demonstrated a well-defined, encapsulated mass measuring approximately 45 × 55 × 39 mm arising from the deep lobe of the right parotid gland and extending into the prestyloid parapharyngeal space. Intraoral fine-needle aspiration cytology suggested a salivary gland neoplasm of uncertain malignant potential (Milan System). Complete surgical excision was achieved using a combined transcervical–intraoral approach without mandibulotomy. Facial nerve integrity was preserved with intraoperative nerve monitoring. Histopathological analysis confirmed pleomorphic adenoma.

Conclusion: Deep lobe parotid pleomorphic adenomas with parapharyngeal extension require a high index of suspicion due to their subtle clinical presentation. Careful preoperative imaging and cytological assessment are essential for accurate diagnosis and optimal surgical planning. The combined transcervical–intraoral approach represents a safe and effective option, offering excellent oncological control while preserving facial nerve function and minimizing surgical morbidity.

Keywords: Parotid gland; Pleomorphic adenoma; Tumor

1. Introduction

Most parotid gland tumors originate from the superficial lobe and typically present as a palpable cervical mass. In contrast, tumors arising from the deep lobe may extend medially into the parapharyngeal space (PPS), often without visible or palpable neck swelling. Consequently, these lesions may present late, with subtle oropharyngeal or pharyngeal symptoms such as dysphagia, foreign-body sensation, or voice changes.

Pleomorphic adenoma (PA) is the most common benign salivary gland tumor; however, deep lobe parotid pleomorphic adenomas with PPS extension are uncommon and pose diagnostic and surgical challenges. Accurate preoperative imaging is essential to define tumor origin, extent, and relationship to surrounding neurovascular structures. Imaging

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findings play a critical role in surgical planning, enabling selection of an approach that maximizes exposure while minimizing morbidity, particularly facial nerve injury.

Retrospective studies comparing transcervical and transparotid approaches with more invasive techniques such as mandibulotomy have demonstrated that less aggressive approaches can achieve satisfactory oncological control with improved functional and cosmetic outcomes when appropriately selected [1,2].

We report a rare case of a deep lobe parotid pleomorphic adenoma with parapharyngeal space extension presenting without an external cervical mass, managed successfully using a combined transcervical–intraoral approach without mandibulotomy. This case highlights the importance of careful clinical evaluation, appropriate imaging, and tailored surgical planning in achieving complete tumor excision while preserving facial nerve function and minimizing surgical morbidity.

2. Case Presentation

A 52-year-old woman with no significant past medical history presented with a 7-month history of progressive oropharyngeal discomfort and a sensation of fullness on the right side of the oropharynx (Figure 1). She reported mild dysphagia but denied neck swelling, weight loss, dysphonia, facial weakness, or pain. Clinical examination revealed a bulge of the right lateral pharyngeal wall without mucosal ulceration. No cervical lymphadenopathy or palpable neck mass was identified, and cranial nerve examination was normal.

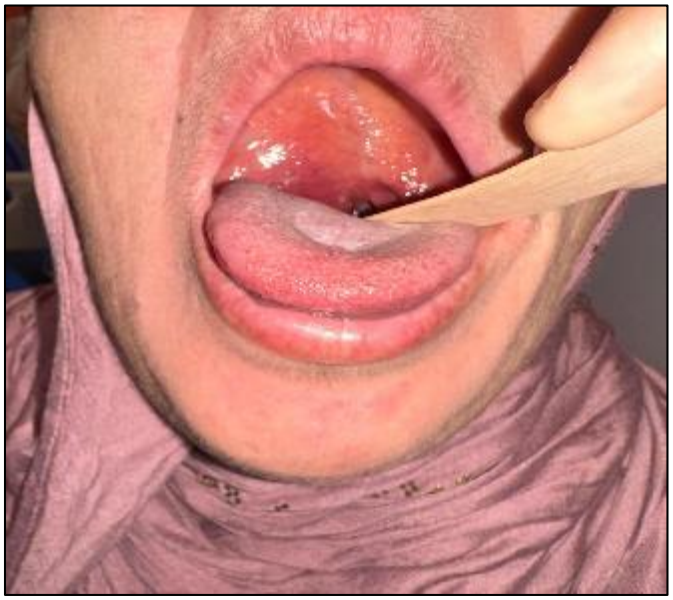

Figure 1 Clinical presentation of the oral mass slightly displacing the lateral pharyngeal wall

An initial contrast-enhanced computed tomography (CT) scan of the neck was performed due to suspicion of a parapharyngeal abscess (Figure 2). The CT revealed a well-circumscribed, hypodense lesion occupying the right retropharyngeal and tonsillar spaces, measuring approximately 43 × 36 mm, with smooth margins and no evidence of gas formation, bone erosion, or surrounding inflammatory changes. The lesion demonstrated minimal enhancement and preserved fat planes, raising uncertainty regarding an infectious origin. Ultrasound-guided needle aspiration was attempted; however, no purulent material or fluid was obtained.

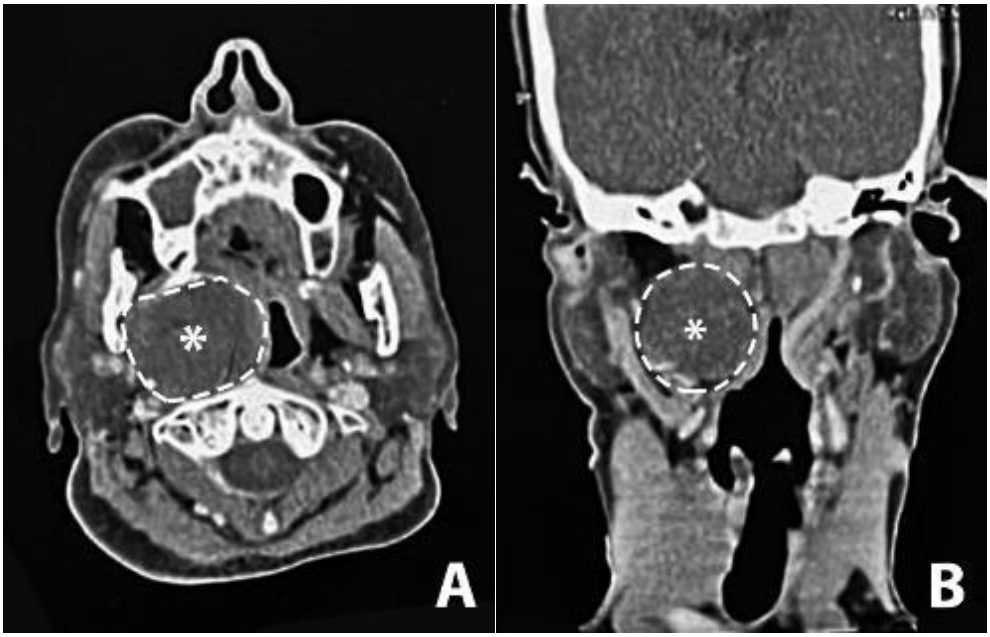

Figure 2 Contrast-enhanced computed tomography (CT) scan of the neck demonstrating a well-defined mass within the right parapharyngeal space. (A) Axial sections showing a hypodense lesion extending medially from the deep lobe of the parotid gland. (B) Coronal sections illustrating the superior–inferior extent of the tumor and its relationship to adjacent parapharyngeal structures

Further evaluation with contrast-enhanced high-resolution magnetic resonance imaging (MRI) of the head and neck demonstrated a well-defined, encapsulated, oval mass measuring approximately 45 × 55 × 39 mm, arising from the deep lobe of the right parotid gland. The lesion extended medially into the prestyloid parapharyngeal space, causing medial displacement of the lateral pharyngeal wall without invasion of adjacent musculature. On MRI, the mass exhibited intermediate signal intensity on T1-weighted sequences and heterogeneous hyperintensity on T2-weighted sequences, with areas of high signal suggestive of myxoid components. Post-contrast images showed heterogeneous enhancement with a well-preserved capsule and clear separation from the carotid sheath structures, which were displaced posterolaterally. No signs of perineural spread or cervical lymphadenopathy were observed (Figure 3).

Intraoral fine-needle aspiration cytology was performed and revealed cellular features consistent with a salivary gland neoplasm of uncertain malignant potential (SUMP), according to the Milan System for Reporting Salivary Gland Cytopathology. After multidisciplinary discussion, surgical excision was recommended.

The patient underwent surgery under general anesthesia following informed consent, including discussion of potential airway compromise and the possible need for tracheotomy. A combined transcervical and limited intraoral approach was selected due to the tumor's deep lobe origin and medial parapharyngeal extension. A modified Blair incision was performed, and a subplatysmal flap was elevated to expose the parotid gland. The main trunk of the facial nerve was identified and preserved with the aid of intraoperative nerve monitoring. A secondary intraoral incision was made in the oropharyngeal mucosa, allowing digital pressure to be applied medially to laterally, facilitating mobilization of the tumor into the cervical field. This dual approach provided excellent exposure and control, enabling meticulous dissection without the need for mandibulotomy.

The tumor was completely excised with its capsule intact (Figure 4 and 5), and careful dissection was performed to preserve surrounding neurovascular structures, including the facial nerve branches, external carotid artery, and internal jugular vein. Hemostasis was achieved using bipolar cautery and ligatures. A closed-suction drain was placed, the cervical incision was closed in layers, and the intraoral mucosa was sutured using absorbable material. The patient was extubated uneventfully, a nasogastric tube was placed temporarily, and she was transferred to the recovery unit without complications. Postoperative facial nerve function was intact. Histopathological examination confirmed the diagnosis of pleomorphic adenoma. The postoperative course was uneventful, and the patient recovered without functional or aesthetic sequelae.

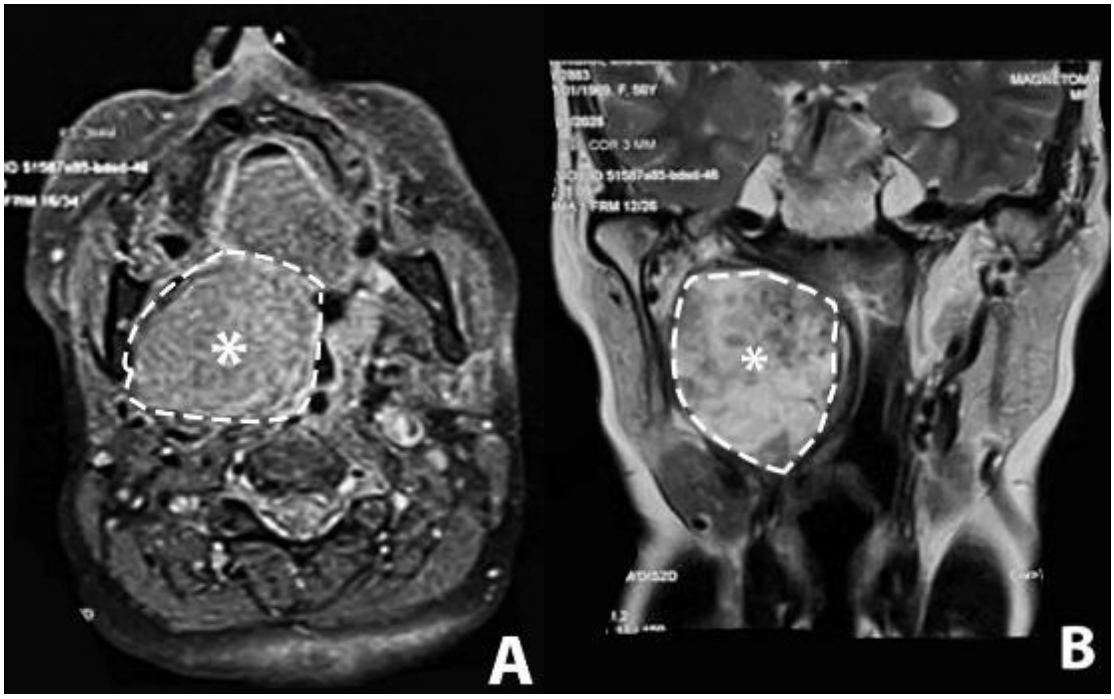

Figure 3 Contrast-enhanced magnetic resonance imaging (MRI) of the neck demonstrating a well-defined mass arising from the deep lobe of the right parotid gland with parapharyngeal space extension. (A) Axial images showing the lesion with intermediate signal intensity on T1-weighted sequences. (B) Coronal images illustrating the medial extension into the prestyloid parapharyngeal space and displacement of the lateral pharyngeal wall

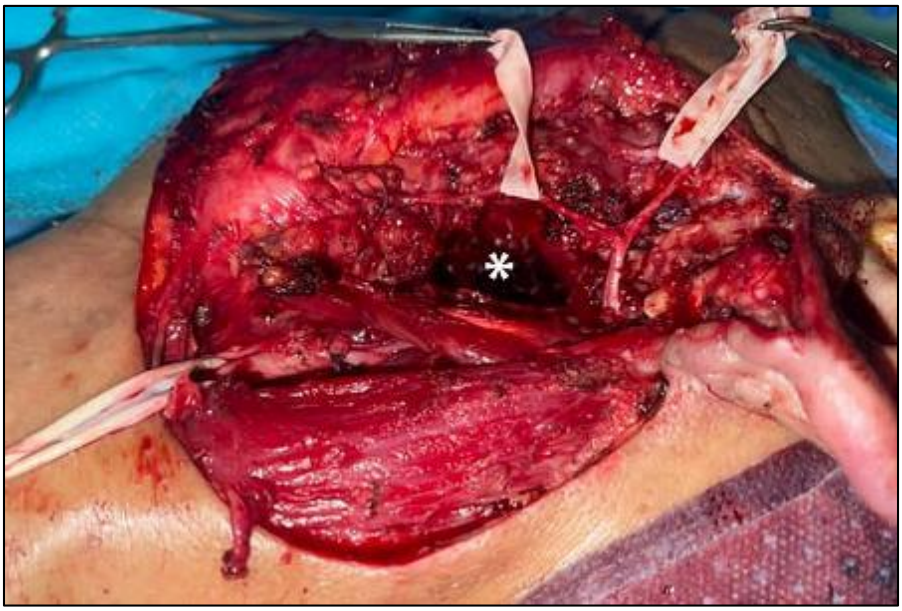

Figure 4 Intraoperative view following complete resection of the parapharyngeal tumor, showing the residual cavity after tumor removal (asterisk)

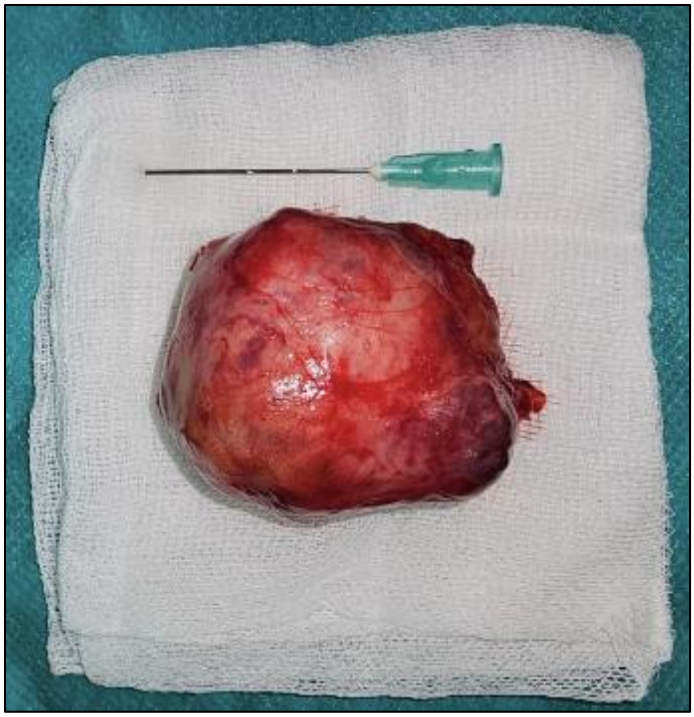

Figure 5 Final excision specimen demonstrating the tumor with preserved capsular integrity

A closed-suction drain was placed, and the cervical incision was closed in multiple layers. The intraoral mucosal incision was sutured using absorbable material. The patient was extubated uneventfully, a nasogastric tube was inserted, and he was transferred to the recovery room without complications. Final histopathological examination confirmed the diagnosis of pleomorphic adenoma.

3. Discussion

Pleomorphic adenoma is the most frequent benign salivary gland tumor and represents the most common histological subtype of parapharyngeal space (PPS) neoplasms originating from the deep lobe of the parotid gland [1,7]. Despite this, parapharyngeal pleomorphic adenomas remain rare overall, accounting for a small proportion of head and neck tumors, largely due to the anatomical confinement of the PPS and the infrequency of deep-lobe parotid involvement [1,10]. Their deep location allows for slow, expansive growth with minimal early symptoms, often resulting in delayed diagnosis until the tumor reaches a considerable size [1,7]. As described in long-term reviews, patients frequently present with vague complaints such as pharyngeal fullness, dysphagia, or intraoral bulging, while an external cervical mass may be absent [1,12]. This atypical presentation was also observed in our case, where the tumor manifested solely as oropharyngeal fullness without palpable neck swelling, emphasizing the need for heightened clinical suspicion in unilateral pharyngeal lesions.

Radiological evaluation is essential for diagnosis and surgical planning in PPS tumors. Magnetic resonance imaging (MRI) is widely regarded as the imaging modality of choice due to its superior soft-tissue contrast and ability to delineate tumor extent, compartment of origin, and relationships with surrounding neurovascular structures [1,3,10]. Typical imaging features of pleomorphic adenoma include a well-circumscribed, encapsulated mass with high signal intensity on T2-weighted sequences, reflecting its myxoid stromal component [1,8]. Computed tomography (CT) complements MRI by assessing bone remodeling, calcifications, and the displacement of adjacent structures, which may aid in determining the tumor's origin [10]. In our case, MRI clearly demonstrated a prestyloid mass arising from the deep lobe of the parotid gland, displacing the parapharyngeal fat and vascular structures without evidence of invasion, findings consistent with previously reported imaging characteristics of deep-lobe pleomorphic adenomas [1,3].

The role of fine-needle aspiration cytology (FNAC) in PPS tumors remains debated. While FNAC can provide valuable preoperative diagnostic information and assist in surgical decision-making, technical difficulty and the proximity of vital neurovascular structures may limit its feasibility or diagnostic yield [1,6]. Several authors recommend FNAC primarily when imaging findings are equivocal or when malignancy is suspected, provided that vascular lesions have been

excluded [1,7]. In our case, FNAC supported the diagnosis of pleomorphic adenoma, allowing for confident surgical planning. Open biopsy is contraindicated in PPS tumors because violation of the tumor capsule increases the risk of recurrence, particularly in pleomorphic adenoma [1,10].

Surgical excision remains the definitive treatment for deep-lobe parotid pleomorphic adenomas with PPS extension [1–4]. The choice of surgical approach is influenced by tumor size, location, extension, and relationship to surrounding structures. Several approaches have been described, including transcervical, transparotid, transoral, and transmandibular techniques, either alone or in combination [7,10,12]. Adequate exposure is essential to ensure complete tumor removal while preserving the facial nerve and major vascular structures [2,3].

The transcervical approach, with or without a transparotid extension, is widely considered the standard approach for most PPS pleomorphic adenomas [2,4,8]. This approach provides direct a-ccess to the PPS, allows safe identification of the facial nerve, and offers sufficient control over major vessels. Large series have demonstrated that transcervical or transcervical–transparotid approaches achieve high rates of complete excision with acceptable morbidity, even for tumors extending into the PPS [2–4]. Reerds et al. reported successful management of deep-lobe parotid tumors with PPS involvement using predominantly transcervical-based approaches, with favorable oncological and functional outcomes [3]. Similarly, Basaran et al. demonstrated that mandibulotomy can be avoided in most cases without compromising surgical exposure or tumor control [4]. In our case, the transcervical route allowed safe identification and preservation of the facial nerve, which was displaced but not invaded by the tumor, consistent with the benign behavior of pleomorphic adenoma [1].

Transoral approaches have been proposed for selected PPS tumors, particularly small, well-encapsulated lesions located medially in the prestyloid compartment [6,9]. Advantages include the absence of external scars and reduced risk to the facial nerve [9]. However, limited exposure, poor vascular control, and an increased risk of incomplete excision or capsular rupture restrict the applicability of this approach, especially for larger tumors [6,9]. Kumar et al. emphasized that tumor size and extension are critical determinants when considering a transoral route, recommending caution in lesions exceeding 3–4 cm [6]. In our case, given the tumor size and deep-lobe origin, an exclusively transoral approach was deemed unsafe.

The transmandibular approach provides excellent exposure for extensive PPS tumors or those involving the skull base but is associated with significant morbidity, including malocclusion, prolonged recovery, and increased risk of cranial nerve deficits [10,12]. Contemporary literature increasingly reserves mandibulotomy for select cases where less invasive approaches are insufficient, particularly in malignant or very large tumors [4,7]. Avoiding mandibulotomy in benign pleomorphic adenoma whenever possible is now widely advocated.

The combined transcervical–intraoral approach employed in our case allowed optimal exposure while avoiding the morbidity associated with mandibulotomy. This hybrid technique facilitated controlled mobilization and en bloc tumor removal, preserving capsular integrity and minimizing the risk of recurrence. Similar combined or modified transcervical approaches have been reported in recent literature, including the semi-transparotid cervical approach described by Bhardwaj et al. for a giant PPS pleomorphic adenoma, with excellent functional outcomes and facial nerve preservation [5]. Our results support these findings and further demonstrate that a tailored, anatomy-driven approach can achieve complete resection with minimal morbidity.

In summary, deep-lobe parotid pleomorphic adenomas with PPS extension present diagnostic and surgical challenges due to their rarity, insidious growth, and complex anatomy. Careful imaging assessment, selective use of FNAC, and individualized surgical planning are essential. The combined transcervical–intraoral approach represents a safe and effective option for large benign PPS tumors, enabling complete excision while preserving facial nerve function and avoiding more invasive procedures such as mandibulotomy.

4. Conclusion

This case illustrates the difficulties in detecting deep lobe parotid tumors with parapharyngeal space (PPS) extension, as they frequently manifest with subtle symptoms and lack apparent neck swelling. Preoperative imaging, particularly high-resolution MRI, is crucial for identifying the tumor's characteristics and guiding the surgical approach. The combined transcervical and intraoral method proved effective, bypassing more invasive procedures such as mandibulotomy while maintaining facial nerve function. Fine needle aspiration cytology (FNAC) aided the confirmation of the diagnosis, allowing a less invasive surgical procedure. This example emphasizes the importance of specific treatment options and the positive outcomes achievable via careful imaging, diagnosis, and surgical approach.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors declare that they have no competing interests

Statement of ethical approval

This case report was conducted in accordance with the principles outlined in the Declaration of Helsinki. In line with institutional policy, ethical committee approval was not required as the report involves a retrospective description of a single clinical case with no identifiable personal information and no experimental intervention.

Statement of informed consent

Written informed consent was obtained from the patient's legal guardian for the publication of this case report and accompanying images.

Consent for publication

Consent for publication of the case details and figures was obtained from the patient's legal guardian.

Availability of data and materials

All data generated or analysed during this study are included in this published article. Further information is available from the corresponding author upon reasonable request.

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Authors' contributions

YR performed the surgery, led the clinical management, and prepared the manuscript. RM, OO, and MC contributed to case documentation, imaging interpretation, and literature review. YL and AR supervised the clinical management and critically revised the manuscript. All authors reviewed and approved the final version of the manuscript.

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