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Up and-coming Bronchoscopic Ablation Therapies for Treatment of Lung Cancer

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Stereotactic beam radiation therapy (SBRT) has traditionally been the standard of care for patients with early-stage lung cancer and thoracic oligometastatic disease who are not surgical candidates. SBRT has been defined as large doses of radiation (> 6 Gy/fraction) administered over a few (≤ 5) fractions¹. This administration of large doses of radiation can be associated with significant toxicities both to the treatment sites and the adjacent normal structures that can become collateral damage. Complications include pneumonia, pneumonitis, chest wall pain, rib fractures, brachial plexus injury, etc.²⁻³ The risk of complications seems to be higher for more central and 'ultra' central tumors as they are situated closer to the critical thoracic structures⁴. Similarly, patients with pre-existing interstitial lung diseases are at a higher risk of pneumonitis as well, with some studies reporting a risk of fatal radiation pneumonitis at 6%⁵.

Given the above limitations, there has been a significant interest in developing minimally invasive ablative technologies that can be administered via transbronchial or image-guided transthoracic routes. These modalities include radiofrequency ablation (RFA), microwave ablation (MWA), cryoablation, and more recently pulsed electric field (PEF) systems. RFA involves placing a probe into the lesion, through which alternating current is passed. This produces heat and can generate a temperature of $> 100^{\circ}\text{C}$ in

the vicinity of the target with resultant necrosis of the lesion⁶⁻⁷. However, as the lesion is charred, it impedes the conductance of current and heat, which may limit the ablation zone. Similarly, blood flowing through any adjacent vessels acts as a 'heat sink', thereby making it harder to reach the intended target temperature and therefore limiting the ablation efficacy and zone. MWA which uses alternating electromagnetic waves to oscillate water molecules and generate frictional heat, is more resistant to these limitations and therefore can potentially achieve higher temperature and a larger ablation zone⁶. Pneumothoraces and bleeding are the most significant complications for MWA⁸⁻⁹. Tumor cryoablation involves introducing a cryoprobe into the lesion; multiple freeze-thaw cycles are then used to induce cell death. Like most image-guided transthoracic ablative modalities, the most frequent complication is pneumothorax; however, more serious complications such as hemopneumothorax and hemoptysis have also been reported¹⁰.

The newest ablation modality is the pulsed electric field (PEF) therapy. Unlike the aforementioned therapies, it doesn't rely on heat or cold to degenerate tumors; rather, it uses brief high voltage current to alter the cell membrane potentials, thereby interfering with normal cell homeostasis and eventually leading the cell death¹¹⁻¹². As a result, the extracellular matrix is preserved. Furthermore, antigens are released from the tumor, which may induce an anti-tumor immune response as well. The fact that extracellular matrix and lymphatic drainage are preserved, together with the

fact that a capsule of scar tissue doesn't form, can potentially further enhance the immune response. The anti-tumor effect is achieved via both direct ablation and indirect immune response. The anti-tumor immune response can be observed at distal tumor sites as well. INCITE-ES is an international treat and resect study for early-stage non-small cell lung cancers to assess the safety and immune activation¹³. Early results suggest PEF therapy induces a strong immune response in the tumors¹⁴. AFFINITY is another major multicenter prospective study assessing the safety and effectiveness of PEF therapy in patients with metastatic pulmonary lesions¹⁵.

In summary, while the data is still limited on the safety, efficacy, and technical parameters for lung cancer ablative therapies, multiple modalities appear promising. There is significant excitement around PEF therapy, since in addition to local ablation it may increase the efficacy of immunotherapy both locally and at distant sites. These therapies can be administered both via transthoracic and bronchoscopic routes. Therefore, it would be feasible to potentially offer a tumor biopsy and therapy in the same setting. Further studies are needed before these ablative therapies can be routinely adopted. However, they are well and truly on the way to becoming alternatives and, in some cases, even replacing SBRT and surgery.

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Technology Corner

Tracheostomy Tubes: Types and their Pros and Cons



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Introduction

Tracheostomy, a surgical procedure involving the creation of an opening in the anterior wall of the trachea, is an intervention performed by many specialists (ENT, Interventional Pulmonology, Trauma, Critical Care, Thoracic Surgery) in a variety of urgent and non-urgent scenarios. It establishes a secure airway in patients who can't be intubated transorally and facilitates transition of care and potentially weaning off the ventilator in critically ill patients who require prolonged respiratory support. Central to this procedure is the tracheostomy tube, a device that maintains the patency of the tracheostomy stoma and airway patency. In this essay, we explore the diverse types of tracheostomy tubes, discussing their features and clinical applications.

Background

Tracheostomy tubes have evolved over the years to meet the specific needs of patients across a spectrum of medical and surgical conditions. The basic design involves a tube inserted into the tracheostomy stoma to secure a patent airway. The materials, shape, and additional features of these tubes vary, catering to the unique requirements of patients with different conditions. Knowing the indications and potential problems of specific tracheostomy tubes is relevant for healthcare providers performing the procedure and caring for patients with indwelling tracheostomy tubes.

Clinical Indications

Common indications include acute upper airway obstruction, post-cricothyrotomy cases, facial/neck fractures, penetrating laryngeal trauma, need for prolonged mechanical ventilation, compromised airway protection (inability to clear secretions despite maximal noninvasive measures), refractory sleep apnea/obesity hypoventilation syndrome, special cases of subglottic stenosis (inoperable and recurrent after multiple endoscopic procedures and not amenable to stenting), severe vocal cord paralysis, burns or inhalation injuries, and anatomic abnormalities altering upper airway structure. In our practice, primary use involves ventilator weaning for critically ill patients with acute respiratory failure or neurologic disorders requiring prolonged ventilatory support.

Types of Tracheostomy Tubes: Features and Clinical Utilization

Tracheostomy tubes come in various types from several manufacturers, each designed to address specific clinical needs (Table 1).

The dimensions of tracheostomy tubes are given by their inner diameter, outer diameter, length, and curvature (degree of angulation). Differences in dimensions between tubes with the same inner diameter from different manufacturers may have important clinical implications, depending on the other features.

Diameter: If the inner diameter is too small, it will increase the airflow resistance through the tube and make the airway clearance more difficult. Larger outer diameter tubes will be more difficult to pass through the stoma and could result in cartilage fracture and subsequent stenosis or malacia.¹⁻³ If the outer diameter is too large, the leak with the cuff deflated will be decreased, and this will negatively impact the ability to use the upper airway with cuff deflation for speech prior to the tracheostomy tube exchange (when possible). Smaller outer diameter tubes, on the other hand, may require increases in the cuff pressure needed to avoid significant cuff leak and high pressures could eventually lead to stenosis at the level of the cuff.⁴

Length: If the tracheostomy tube is too short, the distal end can get obstructed against the posterior tracheal wall, or even against the anterior wall if the insertion site is high (due to tube angulation). This can be remedied by using a larger tube, a tube with a different angle (see Table), a tube with a more flexible shaft, or a tube with extra length. Extra length tubes are constructed with extra proximal length (vertical extra length) or with extra distal length (horizontal extra length) (Figure). Extra proximal length facilitates tracheostomy tube placement in patients with a large neck circumference, which can be measured by bedside ultrasound or neck computed tomography, when available. Extra distal length facilitates placement in patients with tracheal stenosis, tracheomalacia or tracheal anomalies that need to be bypassed or, as in our practice, in certain patients, to assure a more proper alignment of the tube with the tracheal lumen axis. Care must be taken to avoid inappropriate use of these tubes because they may even cause carinal trauma if too long or induce distal tracheal stenosis if the cuff is inadvertently overinflated.

Cuff: Tracheostomy tubes can be cuffed or uncuffed. Uncuffed tubes allow airway clearance but provide no protection from aspiration and cannot usually be used for ventilation if patients need ventilatory support. Cuffed tracheostomy tubes allow secretion clearance and offer some protection from aspiration, and positive pressure ventilation can be more effectively applied when the cuff is inflated. Specific types of cuffs used on tracheostomy tubes include high-volume low-pressure cuffs, tight-to-shaft cuffs (low-volume high-pressure), low volume-low pressure cuffs and foam cuffs (Table). *High-volume low-pressure cuffs* are most used and maintaining optimal tracheal cuff pressure is crucial for patient safety. The normal tracheal capillary perfusion pressure is 25–35 mm Hg. Cuff pressure should be kept at 20–30 cm H₂O (15–22 mm Hg) and monitored every shift to minimize risks of tracheal injury (when too high) and aspiration (when too low). Regular monitoring, especially during tube changes or position adjustments, is recommended but in practice this is extremely difficult to achieve and in fact, in a study, underinflation (pressure < 20 cm H₂O) was noted in 54% of patients, and overinflation (pressure > 30 cm H₂O) occurred in 73% of patients.⁵ Two cuff types, *the low volume, high pressure and foam cuff*, serve different purposes. The former minimizes airflow obstruction outside of the tube when the cuff is deflated and is intended for patients requiring intermittent cuff inflation. The *foam cuff* consists of a large-diameter high residual volume cuff composed of polyurethane foam. It was designed to address the issues of high lateral tracheal wall pressures, that lead to complications

such as tracheal necrosis and stenosis (Figure). Despite its advantages, the foam cuff is not widely used, typically reserved for patients with existing tracheal injuries. Regular cuff deflation is advised to check integrity and prevent adhesion to the tracheal mucosa.

The newer model of *low pressure, low volume cuffs* have a tapered shaped (Taper Guard) cuff (Figure), and in experimental models has less lateral wall pressure and larger inner diameter facilitating increased airflow around the outer cannula (when cuff deflated). There are reports of increased cuff leak with these tubes as the tapered cuff design may fit differently in patient's airways over time but this could also be due to decreased airway edema or a component of tracheomalacia at tracheostomy cuff site⁶

Adjustable tubes: Several tube designs have a spiral wire-reinforced flexible design (See Bivona tube, Figure). These tubes are not compatible with lasers, electrosurgical devices, or magnetic resonance imaging. Some have a moveable flange designed to allow adjustments to better fit the tube to the patient's unique anatomy. Because the locking mechanism on the flange tends to deteriorate over time, these tubes should be considered a temporary solution. For long term use, the adjustable flange tube should be replaced with a tube that has a fixed flange. Custom-constructed tubes are available from several manufacturers to meet this need.

Inner cannula: Some tracheostomy tubes are used with an inner cannula known as dual-cannula tracheostomy tubes. In some cases, the ventilator adaptor is on the inner cannula, and the ventilator cannot be attached unless the inner cannula is in place. The use of the inner cannula allows it to be cleaned or replaced at regular intervals without removing the tracheostomy tube from its stoma. The inner cannula can be removed to restore patent airway if the tube occludes, which may be an advantage for long term use outside an acute care facility. One potential issue with the use of an inner cannula is that it reduces the inner diameter of the tracheostomy tube; thus, the imposed work of breathing for a spontaneously breathing is increased. Of note, if a fenestrated tracheostomy tube is used, the inner cannula occludes the fenestrations unless there are also fenestrations on the inner cannula.

Fenestration: The fenestrated tracheostomy tube is similar in construction to standard tracheostomy tubes with the addition of an opening in the posterior portion of the tube above the cuff (Figure). With the inner cannula removed, the cuff deflated, and the normal airway passage inlet of the tube occluded (capped tube), the patient can inhale and exhale through the fenestration and around the tube, unless upper airway obstruction precludes it. The cuff must be completely deflated before the tube is capped. In our experience, fenestrated tracheostomy tubes often fit poorly and thus do not always work as intended. The standard commercially available tubes can significantly increase flow resistance through the upper airway if the fenestrations are not properly positioned. Furthermore, the fenestrations may cause the formation of granulation tissue, resulting in airway compromise.

Subglottic suction: Tracheostomy tubes that provide a suction port above the cuff are available. The subglottic suctioning cannula is located on the exterior surface of the cannula as a separate lumen, which can be connected to intermittent or continuous suction, and is intended for the evacuation of secretions situated above the tracheostomy tube cuff (Figure, Table).

Conclusion:

The diversity of tracheostomy tubes reflects the multifaceted nature of patient needs in various clinical scenarios. Selecting the appropriate type involves a careful consideration of the patient's medical condition, neck and airway anatomy, anticipated duration of tracheostomy dependence, and the need for specific features such as cuff inflation or fenestration. Advances in tracheostomy tube

technology are needed to take into account the unique requirements of each patient, ensure optimal outcomes, avoid complications and enhances the overall quality of life of patients with indwelling tracheostomy tubes.



Figure 1. Types of cuffed tracheostomy tubes
 A. Portex; B. Shiley; C Shiley Proximal XLT; D Shiley Distal XLT; E. Bivona adjustable; F. Low Pressure, low volume cuff (Taper Guard); G. Foam cuff; H. Fenestrated tracheostomy tube; I. Subglottic suction port tracheostomy tube

Tracheostomy tube Name	Manufacturer	Sizes ID/OD (mm)	Inner Cannula	Cuff	Comments
Bivona Tight-To-Shaft (TTS) Tubes	Smiths Medical	6.0/8.8 7.0/10 7.5/10.5 8.0/11 8.5/11.8 9.0/12.3	Yes	Low volume high pressure Cuff (LVHP), Tapered cuff These cuffs are filled with sterile water, not air.	“Tight-to-shaft” means when deflated, the cuff lays flat against the shaft of the trach tube. Recommended for patients being weaned from ventilation.
Bivona Aire-Cuff Tubes*	Smiths Medical	6.0/8.8 7.0/10 8.0/11 9.0/12.3 9.5/13.3	Yes	“Aire” indicates cuff to be filled with air. These are “mid-range” high-volume, low-pressure cuffs (HVLP). They come in tapered or cylindrical shapes; **Portex-Bivona regular length, fixed and adjustable tracheostomy tubes typically available with TTS cuffs or Aire-Cuf. Air-filled cuffs designed to provide a secure and comfortable seal. The Aire-Cuf™ technology allows for cuff inflation and deflation to achieve an optimal seal while minimizing the pressure on the tracheal wall	Recommended for patients on long term ventilatory support. Inflatable cuff is soft, flexible, and designed for secure seal with minimal pressure on the tracheal wall. Additional options include talk attachment, fixed or adjustable flanges

Bivona Fome-Cuf Tubes	Smiths Medical	9.5/13.3	No	Tapered cuff design. A foam-filled cuff refers to the presence of a cuff that is filled with a soft, pliable foam material. This cuff places lower pressure on the tracheal wall. It passively inflates	Recommended for patients with risk of tracheomalacia. Cuff expansion adjusts to tracheal wall changes while maintaining a seal. Suitable for long term use. Caution: If the cuff breaks in the patient, the the foam part of the cuff cannot be deflated
Bivona Blu-Select Tubes	Smiths Medical	6.0/9.2 7.0/10.5 7.5/11.3 8.0/11.9 8.5/12.6	Yes	Tapered cuff, HVLP	Tubes and packaging are color coded by size
Bivona Portex Blue Line Ultra Tubes	Smiths Medical	6.0/9.2 7.0/10.5 7.5/11.3 8.0/11.9	Yes	HVLP cuff Cylindrical shape	The Blue Line Ultra cuff is designed to offer a secure seal with minimal pressure, suitable for long-term use
Bivona Portex Blue Line Ultra Fenestrated	Smiths Medical	6.0/9.2 7.0/10.5 7.5/11.3 8.0/11.9	Yes	HVLP, Cylindrical	Needs a fenestrated inner cannula to function for speaking purposes. Caution: Fenestrations can become clogged up with secretions.
Bivona Blue Line Ultra Suction-aid Tubes	Smiths Medical	6.0/9.2 7.0/10.5 7.5/11.3 8.0/11.9	Yes	HVLP Cylindrical	Incorporates a subglottic suction line
Bivona Uni-Perc Adjustable Flange	Smiths Medical	8.0/12.6 9.0/13.6	Yes	HVLP, Cylindrical	Recommended for patients with long or thick necks. Allow tube length variation on vertical and horizontal planes.
Shiley "Legacy" Tracheostomy tube	Medtronic	5.0/9.4 6.4/10.8 7.6/12.2 8.9/13.2	Yes	HVLP, Barrell-shape	It uses Jackson sizing*
Shiley Flexible tracheostomy with taper-guard	Medtronic	6.5/9.4 7.0/10.1 7.5/10.8 8.0/11.4 8.5/12.2 9.0/12.7 10.0/13.8	Yes	Taper-guard Low volume Low Pressure (LVLP)	Integrated 15 mm adapter is part of the trach, and this allows the tracheostomy tube to be connected to the ventilator with or without inner cannula in place
Shiley Proximal Extended long tracheostomy tubes (XLT)	Medtronic	5.0/9.6 6.0/11 7.0/12.3 8.0/13.3	Yes	HVLP	Choose extra length in the proximal portion to accommodate increased skin-to-tracheal-wall distances in patients with large neck circumference.
Shiley Distal XLT	Medtronic	5.0/9.6 6.0/11 7.0/12.3 8.0/13.3	Yes	HVLP	Tubes with extended distal length compensate for conditions such as tracheal stenosis or malacia, which often require extra length to bypass the abnormal tracheal pathology
Shiley Fenestrated tubes	Medtronic	5.0/9.4 6.4/10.8 7.6/12.2 8.9/13.8	Yes	HVLP Taper	Allows airflow through fenestration for speech

Table 1. Types of commonly used cuffed tracheostomy tubes and their features.

HVLP: High volume, low pressure

LVHP: Low volume, high pressure

LVLP: Low volume, low pressure

*There are two different methods for sizing tracheostomy tubes, and it's important to note that sizes among brands are not equivalent. Jackson sizing is specific to Shiley regular and their flexible tracheostomy tubes only. The size of the tracheostomy tube does not correspond to any actual measurement of the tube. International sizing organization (ISO) is used by all other tracheostomy tube manufacturers, including for Shiley XLTs. The size of the tracheostomy tube refers to the inner diameter of the tube without the inner cannula.

Note: Custom-made tracheostomies can be made based on bedside or radiologic measurements

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Management of Post Intubation Tracheal Stenosis: tips from a multi-disciplinary airway team



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Post Intubation Tracheal Stenosis (PITS) is a well-described complication of endotracheal intubation that can pose significant challenges to manage effectively. Symptomatic PITS can affect 1-5% of patients who are intubated and treatment should be tailored for each patient based on a multidisciplinary approach considering non-surgical (endoscopic) and surgical interventions (1, 2).

Herein we present a few strategies and technical tips from interventional pulmonology (IP) and thoracic surgery (TS) employed at the University of Chicago Medicine.

Indications

Patients may present with central airway obstructive symptoms such as progressive dyspnea, wheezing/stridor, and difficulty clearing secretions. As a rule of thumb, nearly 50% narrowing of the cross-sectional area of the trachea is needed before an active person experiences dyspnea. Audible stridor usually occurs when the airway diameter is about 4-6 mm. Other causes of dyspnea should also be considered, particularly for patients previously on mechanical ventilation who may have sustained neuromuscular and/or pulmonary parenchymal contributions to their symptoms.

It is reasonable to attempt endoscopic management first, particularly for simple strictures (<1 cm in length and without associated malacia (chondritis)) without cricoid involvement. The success rate of laser-assisted mechanical dilation in such cases is >60% (3). Surgical referral should be pursued in patients who have cricoid involvement, have required multiple endoscopic interventions, and in those with complex lesions (>1cm, with malacia or full thickness injury) as recurrence is very high (80%) (1). Repeat endoscopic interventions may lead to excessive mechanical or thermal trauma that can worsen the extent of the stenotic segment and potentially convert operable patients to inoperable (4). In such cases, patient- and lesion-specific factors should be evaluated to assess whether tracheal resection is anatomically and physiologically appropriate. In appropriately selected patients surgery has a high success rate >95% (1).

Patients should not undergo surgical resection if they are “unfit” for surgery due to poor cardiopulmonary reserve, dependent on mechanical ventilation, have underlying chronic disease or anatomy which would lead to anastomotic failure or re-stenosis (e.g. on high dose steroids, inflammatory disease such as GPA, long-segment stenosis (longer than 4-5 cm)) (1). Poor surgical candidates will need a silicone stent either long term (typically 12 months or longer) or until they become operable (1). Up to a half of patients who undergo stenting may have them removed without the need for additional intervention, perhaps as a result of airway remodeling (1). Patients who cannot tolerate stenting and are also not surgical candidates may be considered for tracheostomy.

Planning

Bronchoscopy is essential for appropriate patient selection and subsequent procedural planning. Specifically, we use it to obtain precise measurements and define airway anatomy (length of stenosis, location in relation to cricoid and carina). Bronchoscopy can also identify other etiologies for stenosis (e.g. GPA, RP), the presence or absence of malacia, active inflammation, and rule out laryngeal lesions (such as inadequate glottis from stenosis, ulceration, granuloma, vocal cord paralysis) which would limit the success of tracheal interventions.

Our typical practice is to perform airway assessments with a flexible bronchoscope. The setting and need for an artificial airway depend on

the operator's preference and clinical scenario. We prefer to perform this under moderate sedation so the patient can cooperate with various respiratory maneuvers (deep inhalation, forced exhalation, coughing) which allow detection of concurrent airway malacia or functional obstruction. In an anesthetized patient we attempt to simulate this by applying suction. Patients who are in respiratory distress are typically taken directly to the OR as below (see *Urgent Management*). Additional workup includes serologic testing for GPA, CT neck/chest to evaluate for evidence of other airway pathology, and pulmonary function testing with evaluation of flow-volume loops and assessment of sitting/supine symptoms and forced vital capacity.

In all patients, management of concurrent or exacerbating conditions should also ideally be optimized, including acid reflux, cardiac disease or volume overload, and obstructive lung disease prior to invasive interventions directed at PITS. Prior to surgical intervention, chronic steroids should be weaned, and diabetes mellitus should be controlled.

Procedure

Endoscopic treatment typically involves a combination of thermal therapy to cut the scar/stricture followed by gentle dilation. Thermal therapies include KTP laser or electrocautery knife or needle and in our practice both are employed based on equipment availability and ability to appropriately align the tool with the lesion in the airway. We will typically make anywhere from 1-3 radial incisions into an area of scar or stricture depending on the extent of involvement. Dilation following thermal therapy is likely to be more effective than dilation alone in opening the airway and delaying recurrence. In addition, dilation without prior radial incision will result in excessive mechanical trauma which by itself can promote recurrence. Dilation may be performed with commercially available dilating balloons and/or a rigid bronchoscope if one is employed [Figure 1]. Occasionally, we use endotracheal tubes of increasing size or Jackson dilators, especially if working in conjunction with ENT and the patient is under suspension laryngoscopy (for high stenotic lesions). In patients who had a significant benefit but experience a recurrence, we will proceed with a maximum of 3 repeat endoscopic interventions while they undergo evaluation for surgical candidacy. We will also consider intra-lesional steroid injection under direct visualization (40mg of triamcinolone) in patients who recur with evidence of inflammation at time of repeat bronchoscopy.

Silicone stents improve respiratory symptoms, however migration and mucus occlusion are important adverse considerations. Further, placing an appropriately sized silicone tracheal stent requires an adequately sized rigid bronchoscope, which in our experience is not always easy to insert and maneuver. A smaller rigid tube may only permit placement of a smaller diameter stent that is more prone to migration. Mucus plugging can also be an issue if patients are not adherent with saline nebulizers. We therefore typically reserve the use of silicone stents long-term for patients whose disease is not amenable to thermal therapy/dilation and who are not surgical candidates. Bare metal stents carry a black box warning by the U.S. Food and Drug Administration for benign airway stenosis and should not be used.

Surgical management involves either laryngotracheal resection (if the cricoid is involved) or tracheal resection, followed by reconstruction. In our institution, we use cross-field ventilation and total intravenous anesthesia. After adequate exposure of the trachea through a collar incision, the stenotic segment is resected. Stay sutures are placed so that intermittently the surgeon can check the level of anastomotic tension by approximating the 2 cut ends of trachea. Once satisfied with resection, the anastomosis is performed using absorbable suture. Muscle buttress flaps are placed to protect the anastomosis and a chin stitch ("Grillo stitch") is applied to remind the patient not to extend the neck excessively. Surveillance bronchoscopy is performed on postoperative day 7 to assess the integrity of the anastomosis [Figure 2].

Urgent management

Symptomatic patients with a critical airway may require urgent intervention without the extensive prior evaluation detailed above. We favor transferring these patients to the ICU and temporizing with upright positioning and consideration of positive airway pressure and/or heliox (effective at 80:20 or 70:30 mix and should not be used if the patient requires more than 30% oxygen). Intubation or bronchoscopy at the bedside should be avoided when patients are critical, especially if there is a lack of advanced equipment and personnel availability. Securing the critical airway should be done in the operating room with readiness to use a rigid bronchoscope if needed. Surgical teams may be needed on standby to access the airway if this is not possible from above depending on operator experience and institutional process. In appropriate patients who are markedly and rapidly decompensated, extracorporeal support (ECMO) may also be considered, though in our experience this has not been necessary with a multidisciplinary airway team. There is no role for emergent tracheal resection and reconstruction.

Quality Control

We conduct thorough pre-procedural assessments as above aimed at confirming that a patient's symptoms are most likely from PITS, that contributing and comorbid factors are well managed. Multidisciplinary meetings are the norm in our institution and often patients undergo

joint procedures by two or more airway specialists (IP, ENT and TS). These discussions as well as pre-intervention bronchoscopy aid greatly in personalizing treatment and assuring avoidance of unnecessary repeated endoscopic procedures for complex lesions or premature surgical resection of simple strictures that would have otherwise responded to laser-assisted mechanical dilations. With all interventions, we will typically perform surveillance flexible bronchoscopy – around 1-3 months following endoscopic intervention, and for surgical patients at 1 week and 3 months post-op.

Figure Legend

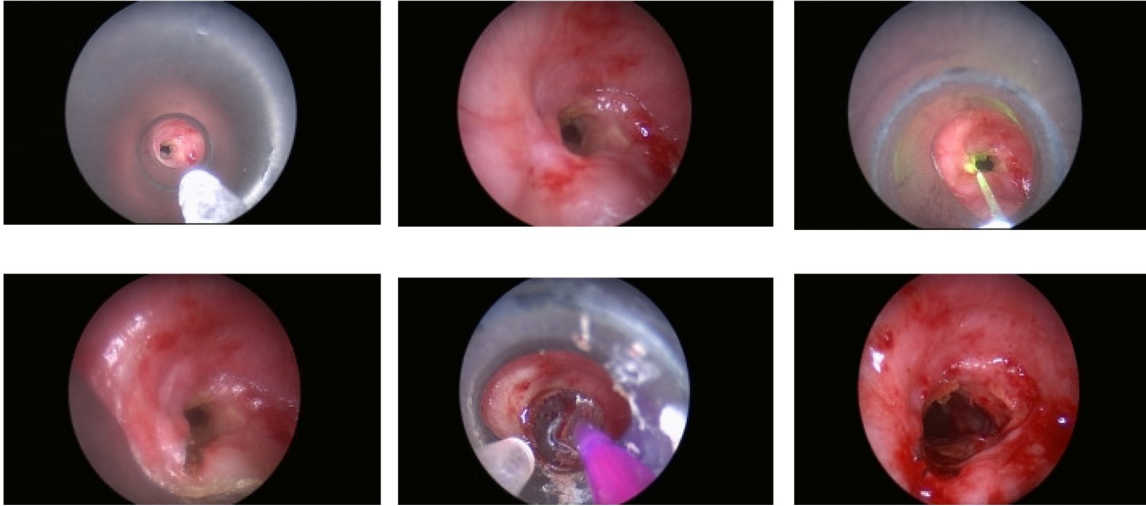


Figure 1. Complex, circumferential tracheal stenosis seen during rigid bronchoscopic intubation (top left) and close view (top center). This was managed by laser assisted mechanical dilation. The stricture was cut using KTP laser for two radial incisions (top right and bottom left images). In this case, we decided to initially use a balloon for the dilation (bottom center) as the stricture felt very hard, and we try to avoid both mechanical and thermal trauma when managing these patients. The airway patency was restored (bottom left).

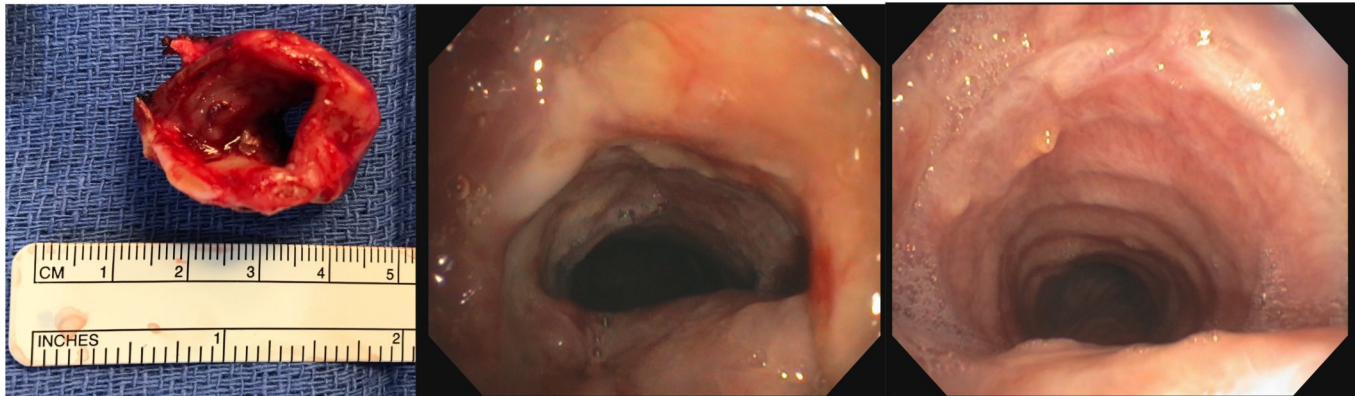


Figure 2. Resected tracheal stenosis segment showing “full thickness” airway involvement, unlikely to resolve with multiple dilations (left). Bronchoscopy at day 7 (center) and 3 months post op (right) showing healed anastomosis and no recurrence.

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Humanitarian News

International Humanitarian Law and the Israel-Palestine Conflict

Most of people are likely to find it challenging to maintain rationality amidst the overwhelming sense of sorrow that accompanies the recent events in Israel and Gaza.

Even if the Hamas incursion and Israel's siege and shelling of the densely populated Gaza Strip continue to cause crimes and deaths, international law can guide an examination of the current situation. New information is released daily. Verifying specifics takes time, disinformation is widespread, and debates about unsubstantiated claims may get boring. War rules determine what matters and what should happen next.

In fact, the exceedingly complex situation in the Gaza Strip has led to discussions over whether both groups' activities violate international humanitarian law. Like many other subjects, the public, communicators, and media voice strong opinions without knowing international humanitarian law or how it applies to this conflict's protagonists. Emotions, prejudices, geopolitical interests, and political positionings drive political leaders, human rights advocates, and ordinary individuals to view information differently. Different judicial bodies may rule differently on the same text, as with any legal theory. This form of inescapable ambiguity is not exhaustive, as many civil, criminal, and international legal situations are clearly right or wrong.

International humanitarian law comprises a set of regulations aimed at mitigating the impact of armed conflicts for humanitarian reasons. It safeguards individuals who are not actively participating in hostilities and imposes limitations on the methods and means of warfare. Additionally known as the law of war or the law of armed conflict, international humanitarian law is an integral component of international law, which governs the interactions between sovereign states. This body of law is delineated in agreements such as treaties or conventions, customary rules derived from state practices seen as legally binding, and general principles.

The scope of international humanitarian law is restricted to armed conflicts and does not dictate whether a state is permitted to employ force; this aspect is governed by a distinct section of international law outlined in the United Nations Charter. While the roots of humanitarian law trace back thousands of years, the modern version, encapsulated in the Geneva Conventions of 1949 and other treaties, has evolved over time. The universal codification of these laws commenced in the nineteenth century, with states progressively agreeing upon practical rules shaped by the harsh lessons of contemporary warfare. These rules aim to strike a delicate balance between humanitarian considerations and the military needs of states. Today, international humanitarian law represents a universally recognized body of legal principles.

Nearly every government has signed the Fourth Geneva Conventions of 1949 and the 1977 Additional Protocols that protect victims in armed conflicts and enhance these Conventions.

Various agreements restrict certain weapons and military methods while protecting particular organisations and assets as the 1954 Convention for the Protection of Cultural Property in the Event of Armed Conflict, the 1972 Biological Weapons Convention, the 1980 Conventional Weapons Convention with its five protocols, the 1993 Chemical Weapons Convention, the 1997 Ottawa Convention on anti-personnel mines, and the 2000 Optional Protocol to the Convention on the Rights of the Child on child involvement in armed

Many parts of international humanitarian law are customary law, binding on all governments. This legislation only applies to military conflicts, not internal tensions or isolated violence. After a disagreement begins, the law applies impartially to all sides. International humanitarian law distinguishes between international (IAC) and non-international armed conflicts (NIAC), with the former involving at least two nations and operating under the Fourth Geneva Conventions and Additional Protocol I. On the other hand, non-international armed conflicts refer to hostilities that are limited to the territory of a single State and include either conventional armed forces combating armed dissident organisations or armed groups engaging in combat with each other.

There is often a misconception regarding the interchangeability of humanitarian law with human rights law. It is essential to differentiate between them. While there may be some parallels in their legislation, these two legal systems have developed separately and are covered by separate treaties. Human rights legislation is specifically valid during periods of peace, in contrast to international humanitarian law. However, some provisions under human rights law may be temporarily suspended during times of armed conflict.

Humanitarian News

The rules of law are non-reciprocal, meaning they are applicable regardless of the actions of the opposing party. Violations, such as intentionally targeting civilians or imposing collective punishment, cannot be justified by arguing that another party has committed violations or that there are power imbalances or other injustices.

The primary principle of international humanitarian law during armed conflicts is that all parties are obligated to consistently differentiate between combatants and civilians. It is imperative to refrain from targeting civilians and civilian entities. Parties involved are only allowed to target combatants and military objectives. It goes as far as considering that merely asserting that civilians are not the intended victims of the attack is insufficient. According to international humanitarian law, the parties involved in the conflict are obligated to take all practical measures to reduce injury to people and civilian infrastructure. Attacks that do not distinguish between combatants and civilians or that are likely to cause excessive harm to civilians relative to the military advantage are strictly forbidden.

Prisoners of war and maimed, stranded, or unwell combatants who have ceased participation are also safeguarded under international humanitarian law. Respect for the physical and mental health of individuals belonging to these particular groups is warranted, on account of their mere existence. Ensuring the protection and compassionate treatment of individuals without any form of discriminatory treatment is of the utmost importance.

It is strictly prohibited to intentionally inflict death or injury upon an adversary who surrenders or becomes incapacitated during combat. The party in a position of authority is responsible for gathering and providing medical assistance to individuals who are injured or unwell. Under no circumstances are attacks on medical personnel, medical supplies, hospitals, or healthcare institutions permitted.

The IHL specifies that it is imperative to ensure the safeguarding of all ambulances. Additionally, there exist comprehensive regulations that dictate the specific requirements for the confinement of prisoners of war and the treatment of civilians. This includes the supply of sustenance, lodging, and healthcare, as well as the entitlement to communicate with their relatives.

The legislation establishes a variety of unambiguous symbols that can be employed to distinguish individuals, locations, and items that are under protection. The primary symbols include the red cross, the red crescent, and the emblems that designate cultural property and civil defence institutions.

Furthermore, international humanitarian law strictly forbids any tactics or strategies used in battle that do not distinguish between combatants and non-combatants, such as civilians. It is also crucial to prevent any excessive harm or avoidable suffering. Humanitarian law has therefore banned the use of many weapons, including exploding bullets, chemical and biological weapons, blinding laser weapons and anti-personnel mines.

The laws of war require parties engaged in combat with the intent to damage civilians to furnish "effective advance warning," unless the situation renders such action unfeasible. However, issuing a warning does not absolve any party of the responsibility to protect civilians. Civilians who do not evacuate remain protected despite having been issued a warning. Maintaining their anonymity is of the utmost importance, and assailants must implement every feasible measure to protect them. Statements that are not genuine warnings and instead seek to induce dread in the public through the use of threats of violence in order to coerce them into evacuating are strictly prohibited.

The significance of International Humanitarian Law transcends national boundaries and precludes any exemption for military, security, or national considerations. This is because military imperatives are already duly considered in all instruments of international humanitarian law, which reconcile military necessity with human demands. The International Committee of Red Cross (ICRC) Commentary on the 4th Geneva Convention states that: *"... no Contracting Party can offer any valid pretext, legal or otherwise, for not respecting the Convention in its entirety. ('In all circumstances') also means that the application of the Convention does not depend on the nature of the conflict."* In addition, Article 27 of the Vienna Convention points out that *"a party may not invoke the provisions of its internal law as justification for its failure to perform a treaty."*

Despite the existence of notable cases in which international humanitarian law has successfully protected civilians, prisoners, the injured, and the infirm, as well as restricted the use of cruel weapons, it is evident to an unbiased observer that breaches of international humanitarian law are numerous and on the rise. Civilians are increasingly becoming the principal casualties of warfare and are enduring incalculable suffering.

Humanitarian News

Evidently, substantial obstacles will inevitably be encountered in the enforcement of this legislation, given that it is designed to be implemented during periods of profound unrest. However, it is equally apparent that the international community employs differential standards in its efforts to ensure effective compliance with regulations based on geopolitical or alliance considerations.

The issue of the Israeli-Palestinian conflict is notably sensitive. Palestine's complex history of conflicting claims, numerous geopolitical interests in the Middle East, ambiguous legal status of Palestinian territories, divergent positions within the international community, the unconventional armed force status of Hamas (considered a terrorist organisation by many states), and misinterpretations of opinions regarding Israel's foreign policy as those regarding the Jewish people all contribute to this complexity. Therefore, in addition to the inherent technical challenges associated with interpreting the implementation of International Humanitarian Law (IHL) in this intricate situation, the conduct of each party operating within that legal structure is subject to varying interpretations among scholars, policymakers, political figures, and ordinary citizens worldwide.

The unique Israeli-Palestinian conflict, agreements, and memoranda have created a *lex specialis* regime that governs all aspects of their relationship, including the status of each party in relation to the territory. The UN Resolution adopted by the General Assembly on 9 December 2015 (on the report of the Special Political and Decolonization Committee) declared that UN: 1) *Reaffirms* that the Geneva Convention relative to the Protection of Civilian Persons in Time of War, of 12 August 1949, is applicable to the Occupied Palestinian Territory, including East Jerusalem, and other Arab territories occupied by Israel since 1967 and 2) *Demands* that Israel accept the de jure applicability of the Convention in the Occupied Palestinian Territory, including East Jerusalem, and other Arab territories occupied by Israel since 1967, and that it comply scrupulously with the provisions of the Convention;

In spite of that, in the opinion of Peter Maurer, President of the International Committee of the Red Cross in 2012 (so before the Hamas attack and declaration of war by Israel), the recurrent claim that the Fourth Geneva Convention applies to the territories ignores the unique position of Palestine and this essential body of accords and as Israeli-Palestinian agreements require a final status negotiation to determine territory fate, so he called the ICRC and the international community to remain neutral and not prejudice the conclusion.

Assisting Professor Jérôme de Hemptinne of Utrecht University conducts an exhaustive analysis of whether the NIAC or IAC branch of International Humanitarian Law pertains to the hostilities between the Israeli and Hamas military wing in Gaza. Under IHL, the classification of these conflicts is contingent on whether Palestine is a state and Gaza is an occupied territory. According to him, this categorization is vital for establishing the legal framework that safeguards the rights and obligations of individuals and combatants. The applicability of the IAC and NIAC's hostilities laws at this juncture of the conflict is now comparable as a result of customary IHL. Regarding the accountability of violators of international humanitarian law (IHL) under international criminal law, they diverge. His analysis concludes that the entire Gaza conflict ought to be governed by the one-of-a-kind IAC system. This method also strengthens legal protection for hostilities-threatened persons and property. The International Criminal Court (ICC) would then be competent to prosecute and try several important war crimes that fall under its jurisdiction only if they are committed in IAC, such as disproportionate attacks, using human shields, or using starvation as a weapon. The entire regime of protection in 4th Geneva Convention would benefit civilian populations on both sides, and the ICRC would have regular access to all detainees to verify their conditions and restore family links without belligerent consent (Rule 124 of ICRC Customary Law Study).

Since October 7, Hamas and its supporters have launched hundreds of missiles from Gaza onto Israel, and have breached the Gaza-Israel border barrier on October 7, capturing Israeli military checkpoints and invading Israeli communities and Kibbutzes. They massacred hundreds and abducted 220 troops and civilians to Gaza. After Israeli bombings on Gaza began, Hamas vowed to kill a captive if Israel targeted houses without notice. These violent acts likely constituted IHL breaches under Art. 7 of the Rome Statute of the International Criminal Court (intentional killings, unlawful imprisonments, and civilian hostage-takings may be war crimes under Rome Statute). After Palestine joined the Rome Statute in April 2015, the International Criminal Court has jurisdiction over war crimes perpetrated on Palestinian territory and by Palestinians, including Hamas and PIJ members. Additionally, Art. 34 of the Fourth Geneva Convention and Art. 3 of the Four Geneva Conventions ban the kidnapping of hostages in international and non-international conflicts.

On the other hand, the day after Hamas-led strikes, Israeli Prime Minister Benjamin Netanyahu declared war and retaliated.

Humanitarian News

He stated Israel wanted to annihilate Hamas's Gaza military. Israeli Defence Minister Yoav Gallant then said that he will block off Gaza since airpower would not be adequate to battle Hamas. Instead, Gaza Strip supplies must be cut off. No food, energy, gasoline, medication, or drinking water has been transported to Gaza over Israel's border since October 9, 2023. Prime Minister Netanyahu has stated that Israel will not provide help until Hamas releases the hostages. On October 12, 2023, the Gaza Strip's lone electrical plant stopped down due to fuel shortages. This caused the public electrical supply to collapse, affecting health and drinking water.

Prime Minister Netanyahu urged Gazan civilians to flee battle zones before the air attacks. On October 13, the Israeli military ordered civilians and foreign organisations to evacuate the northern Gaza Strip within 24 hours in preparation for an intensified air campaign or land invasion. In contrast, the Hamas-led administration urged residents to stay in northern Gaza, according to the Israeli military. The UN and human rights organisations asked for the Israeli statement to be withdrawn since a mass evacuation of 1.1 million people was unachievable in 24 hours.

After those events, Gaza's civilian population has few safety options. The UN has no civilian shelters or bunkers, although a few hundred thousand have found refuge in hospitals. Only little supplies and protection are guaranteed there. Rafah, the Palestinian border crossing to Egypt, is restricted to Gazans who wish to flee and has been bombarded by Israel multiple times. Hamas has released few hostages into Egypt.

Regardless matter who started the war, international humanitarian law applies to all sides. What international law allows in an armed confrontation does not rely on whether the side is an aggressor or defence. The only purpose is to safeguard civilians, medical staff, journalists, and cultural property. Indiscriminate assaults (those that target civilians and fighters) must be prevented to guarantee this protection. This restriction applies to all armed conflicts and is codified in Art. 48 of the First and Second Additional Protocols to the Geneva Conventions. Hospitals and medical staff are protected from military strikes if designated properly. Violation of this ban is a war crime under Rome Statute Art. 8.

Due to continuous fighting with Israel and Egypt closing border crossings, Gaza Strip civilians cannot exit the blockade. Egypt permitted some Palestinians to flee Gaza in the early days of the military assault but has subsequently closed the border. Siege warfare—starvation of enemy civilians—is also illegal in all armed conflicts. This implies that only a valid military goal may be locked down or sieged. Civilians may not be targeted by the siege, and basic items may be supplied. Even if combatants could get food, it shouldn't be blocked. A complete shutdown, which makes it impossible to supply Gaza's civilian population with food, drinking water and medicines, is, unlike preventing the import of fuel or the supply of electricity, under no circumstances proportionate and permissible under international law. Not least, the blockade of supplies vital for life is a collective punishment in accordance with Art. 33 of the Fourth Geneva Convention and hence violates international humanitarian law.

The commitment to Israel's security, condemnation of Hamas's atrocities, and support for Israel's goal of eliminating Hamas do not exempt it from international law. Thus, the international community should use its close relations to Israel to negotiate hostage release. It should also establish protection zones, refrain from using prohibited warfare methods, ensure humanitarian access (and halt violence for humanitarian purposes), and facilitate the delivery of drinking water, food, medicines, and hospital generator fuel to all of Gaza. For medical emergencies and international civilian evacuation, humanitarian corridors are needed. Simultaneously, states with ties to Hamas, such as Egypt and Qatar, must pressure the group to protect hostages, advocate for their release, stop rocket fire at Israel, and allow civilians to evacuate combat zones.

We should all be outraged by Hamas' October 7th strikes on Israel. Justice, responsibility, and retribution for these horrible killings, the safe repatriation of captives, and a halt to strikes into Israel must be demanded. However, channelling anger and anguish towards innocent people, like the 99 United Nations Relief and Works Agency for Palestine Refugees (UNRWA) staff members who died, cannot preserve peace and security. Some events taking place in the Gaza strip are obscene, and heart-breaking.

The Israeli government has garnered support from the majority of Western nations since the commencement of the conflict. But over time, several events that many interpret that violate International Humanitarian Law (IHL) and are deemed taboo have caused significant concern, criticism, and calls for action to stop the bloodshed. Israel's military offensive in Gaza, characterised by the use of powerful explosive weapons that have destroyed tens of thousands of structures, is having significant humanitarian and human rights repercussions, as acknowledged by various political leaders, scholars, and UN agency staff, despite ongoing political backing.

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A considerable number of experienced humanitarian workers who are currently on the field find it difficult to fully grasp the abhorrent conditions to which they and the local populace are being exposed. The casualties incurred by humanitarian workers during this conflict, in the first four weeks, surpassed the cumulative toll of humanitarian workers throughout the Syrian civil war that has afflicted the region for the past four years. Intentionally singled out hospitals include Al Shifa Hospital and the Indonesia Hospital; the severity of these assaults on medical facilities is truly disconcerting. The road infrastructure in the vicinity has been significantly impaired due to the strikes, thereby impeding access to the facility. Additional evacuation directives have been promulgated for certain establishments, in conjunction with the overarching instructions for all inhabitants of northern Gaza to evacuate. Nevertheless, these evacuations, which contravene World Health Organisation recommendations, are tantamount to a "fatal sentence" in southern Gaza, where hospitals are unable to accept additional patients due to the total collapse of the healthcare infrastructure.

Under international humanitarian law, medical units must always be protected and respected, with access to humanitarian assistance in its many forms—food, water, and medical supplies—guaranteed in particular. Any Palestinian armed group that defends itself with civilians or property is in violation of war laws. The conduct exhibited by Palestinian armed groups does not absolve Israel (or any other country in similar circumstances) of its responsibility to safeguard civilians and maintain distinction, proportionality, and safeguards in the face of assault. Neglecting to do so constitutes a breach of military regulations. A considerable number of targeted individuals are in no way associated with violations committed by armed groups affiliated with the state or non-state. Reducing or eliminating civilian rights in response to the actions of armed groups over which they have no authority would be illogical.

Self-defense, as invoked by Israel in its response, stands as one of the justifications for war, with Article 51 of the UN Charter safeguarding this right "if an armed attack occurs". The exercise of this right of self-defense, nevertheless, continues to be governed by international humanitarian law. State entities are obligated by *jus in bello* (justice in war) to alleviate suffering during armed conflicts; the lawful exercise of self-defense does not authorise unrestricted use of force. The humanitarian agencies' assertion that both sides should adhere to the principles of International Humanitarian Law (IHL) does not imply a critical assessment of the Israeli government's decision to conduct a military operation, a lessening of the international community's outrage over the initial Hamas attack, or an endorsement of one side or the other in the conflict. *Jus in bello* (international humanitarian law), is merely the body of legislation that governs the course of hostilities. Its solely humanitarian objective is to alleviate the suffering that armed conflicts inflict. It operates autonomously from the motivations or rationales that drive war, as dictated by *jus ad bellum*. Furthermore, it is not the intention of humanitarian actors to comment on political and legal issues affecting the status of Territories and who is entitled to what. However, defending the lives and dignity of aid workers and noncombatants is a critical component of our mission, and we would be failing miserably to our duty if we did not remind both sides of their respective use-of-force restrictions and demand both sides to honour their commitments.

Those who have extensively engaged with press or social media recently may have observed individuals intertwining the righteousness of the conflict itself with the righteousness of its conduct. Some seem to justify the killing of Israeli civilians by condemning Israel's occupation of Palestinian territories, while others seem to downplay the killing of Palestinian civilians in airstrikes, asserting Israel's right to self-defense.

Approaching causes and conduct as distinct matters, as the law does, serves as a method to maintain a clear focus on the intricacies of war and the underlying political questions, without losing sight of the shared humanity on all sides. In the words of Josep Borrell, the head of foreign policy for the European Union, "Israel has the right to defend itself, but it must do so in compliance with international and humanitarian law."

Furthermore, this duty of protection safeguards humanity against its darkest demons, as well as against the disgrace and degradation of the human race, in addition to ensuring the lives and welfare of the affected populace. Beyond the scope of any legislation, violence, bodily injury, fear, hunger, and harm perpetrated on defenceless persons incapable of reprisal are not acceptable under the universal moral code. While this does not imply that it has never occurred before, it does indicate a setback in the development of a moral community. Regardless of the severity of an individual's crimes, even in times of peace and across vastly diverse cultures, the criminal justice system emphasises the value of every human life. Disrespect for human life inflicts severe suffering upon the victims, but inflicts an even greater harm upon the human condition and community membership of those who commit such actions, which are illegal but primarily immoral in nature.

Humanitarian News

The Gazan people are currently completely dependant on international aid; but, with no gasoline, electricity, food, or water, and a besieged region, humanitarian assistance is impossible to deliver. Almost all humanitarian assistance currently depends on UNRWA, whose capacity is nearing the brink of collapse. Characterising the daily situation in Gaza as inhumane would be an inaccurate and insufficient portrayal. A universal sentiment among humanitarian workers who have recently worked in Gaza—and all of them with extensive experience and, unfortunately, a sombre history of witnessing atrocities—is "I never imagined something of this magnitude was even possible."

As a result, an increasing number of non-governmental organisations, United Nations officers, humanitarian affairs experts, and scholars of international humanitarian law are speaking out in support of an immediate ceasefire and suspension of the siege so that adequate aid can be delivered. We do not inquire about the resolution of the conflict or offer suggestions on how it ought to be carried out. We refrain from discussing or expressing public views regarding the legal ramifications of the manner in which the war was conducted. We simply implore the cessation of violence, the guarantee of protection for humanitarian personnel, and the provision of secure access for all recipients of humanitarian aid. We petition for the provision of shelter, food, water, medical care, and medical attention, the release of the captives, and the prevention of any human rights violations that may be brought before the courts.

In addition to the exceedingly perilous repercussions that may befall thousands upon thousands of individuals not only in the region but also in neighbouring or remote nations, we are currently observing one of the most abhorrent humanitarian catastrophes during a modern war. Indeed, we are not merely losing human lives; we are also profoundly losing the scant remnants of humanity that remain on this planet.

We cannot afford to remain indifferent. We do not advocate for an idealised or romanticised future; rather, we caution that failure to establish a minimally more peaceful and compliant global order will render all regions unsafe, because no location is immune to violence in an inhumane world where we forget that even war has rules.

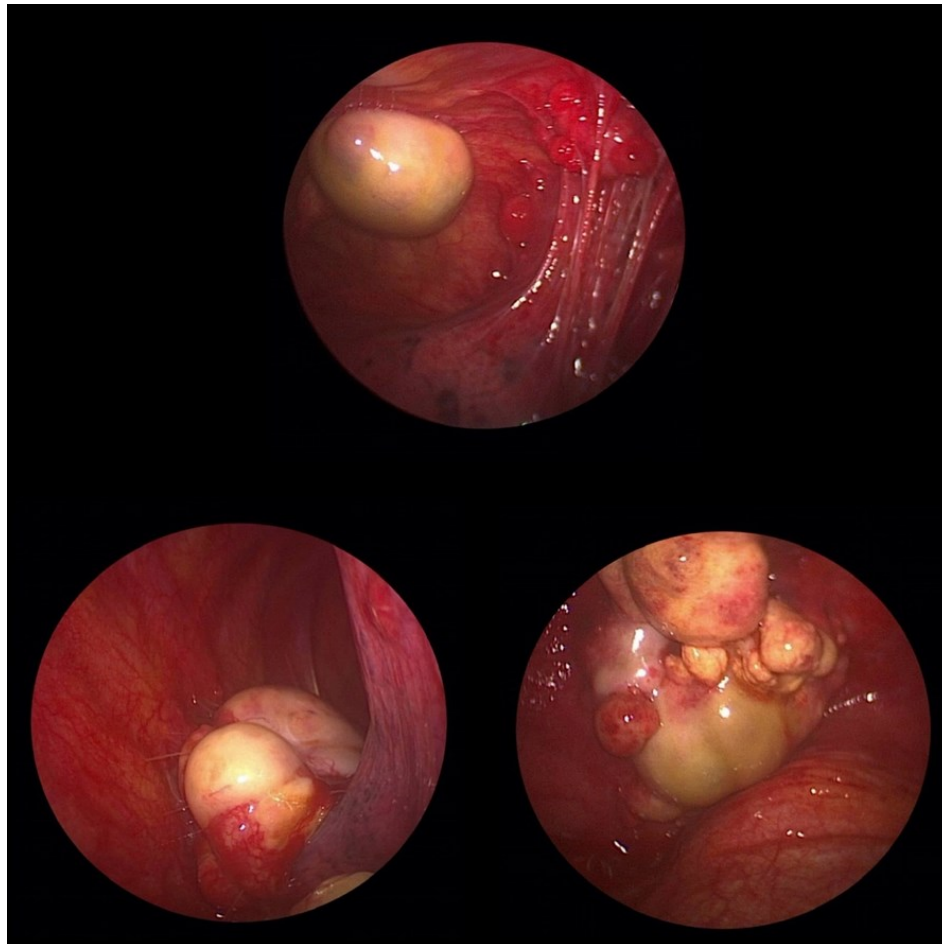
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**The views expressed in this article are those of the author (Silvia Quadrelli) and do not necessarily reflect the official positions of the Executive Board or International Board of Regents of the WABIP.*

Best Image Contest

Best Image Contest 2024 (1 of 3)



Category: Pleural Diseases

Description: RENAL CELL CARCINOMA- METASTASIS TO THE PLEURAL CAVITY

Submitter(s): Preeti Vidyasagar, Harikishan Gonuguntla, Suhas Dhulipala, Geetha Sekar

This image is 1 of 3 selected among 100+ submissions to our Best Image Contest held in late 2023. Our next Image Contest will open later this year. We look forward to receiving your image submissions.

WABIP News

Highlights of WCBIP/ WCBE Congress 2022 Marseille, France during the X Paraguayan Con- gress of Pneumology 2023

On October 25, 2023 the presentation of the highlights of the WCBIP MARSEILLE 2022 was held in Paraguay during the X Paraguayan Congress of Pneumology 2023.

We had the pleasure of having an international speaker Dr. Mohammed Munavvar who presented Pre-Congress Course "Hands-on Interventional Bronchoscopy Workshop Course", which was coordinated by the National Regents Dr. Adid Aluan (current) and Dr. Domingo Perez (former) of the WABIP (World Association for Bronchology and Interventional Pulmonology).

We appreciate the support of these international organizations for the collaborative scientific activity, extending our thanks to the regents of Argentina on behalf of Dr. Agustin Buero and Dr. Silvia Quadrelli with the aim of solidifying the pulmonary interventionalism and thereby increase the quality of patient care in Latin America.



Call for Abstracts - WCBIP Bali Indonesia 2024



WCBIP 2024 BALI

October 23-25, 2024
Bali Nusa Dua Convention Center, Indonesia

We are excited to receive your abstracts for our coming World Congress. Researchers and professionals in bronchoscopy and interventional pulmonology community are welcome to contribute original abstracts in the following areas:

Interventional Pulmonology, Laryngology, Pleural, Tracheobronchology, Thoracic Surgery, Esophagology,

Intrathoracic Cancer, Pediatric Interventional Pulmo-

nology

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Submit your abstracts by **May 1, 2024**



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Research

Cooking Lung Cancer!

Transbronchial Microwave Ablation of Peripheral Lung Tumors



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The exploration and development of Transbronchial Microwave Ablation (TBMA) for lung cancer treatment have been driven by several factors. The increasing availability of CT scans and evidence supporting low-dose CT screening in high-risk populations have led to the incidental discovery of small lung nodules, many of which may be premalignant or early-stage tumors. This has emphasized the need for local treatment of these early-stage lung cancers and oligometastases, particularly in patients unfit for surgery. Traditional thermal ablation methods, such as radiofrequency ablation, carried risks like pneumothorax, bronchopleural fistula, and tumor seeding. Microwave energy, less affected by lung tissue impedance, creates a larger, more predictable ablation zone, making TBMA a promising alternative.

TBMA combines the benefits of microwave energy with a transbronchial approach to avoid pleural puncture and reach lung regions difficult for percutaneous routes. It uses electromagnetic navigation bronchoscopy for navigation and cone-beam CT for accurate determination of the ablation zone. The technique has shown a high technical success rate, short hospital stays, and low complication rates. However, TBMA is not without limitations, such as risks associated with nodule size and location, requiring careful case selection.

Future directions of TBMA include using mobile C-arm machines for 3D reconstructions, making TBMA feasible outside of hybrid operating rooms. Advancements in robotic bronchoscopy are also paving the way for easier, more intuitive TBMA approaches. Investigations into other energy forms, such as thermal vapor and pulsed electric field, are ongoing. TBMA, along with these adjuncts, represents an exciting development in the treatment of lung cancer.

The NAVABLATE study was designed to investigate transbronchial MWA as a minimally invasive treatment option for lung cancer patients ineligible for traditional surgery or stereotactic body radiation therapy(1).

Research

Conducted in two centers in the UK and China, the study enrolled 30 subjects with lung malignancies, 66.7% of which were primary lung cancers and 33.3% oligometastatic. The mean age of participants was 68.4 years, with 40% female representation. A striking aspect of the study was its inclusivity, as 47% of participants were not candidates for surgery or SBRT, with others declining these options.

The technical success of the procedure was outstanding, with a 100% success rate in reaching and ablating targeted nodules. Furthermore, the one-month post-procedure imaging showed 100% technique efficacy, with no new metastatic disease or lymphadenopathy observed. These results are particularly encouraging, considering the mean nodule size was 13.7 mm.

In terms of safety, the NAVABLATE study demonstrated a low adverse event rate. Only 3.3% of participants experienced mild hemoptysis, and there were no incidences of pneumothorax or deaths. Additionally, 13.3% experienced grade 3 complications, but no higher-grade complications were observed.

Patients reported minimal pain and discomfort post-procedure, with a significant decrease in reported pain over a one-month period. This was paralleled by a slight improvement in the overall health assessment of participants, as measured by the EQ-5D-3L scale.

The NAVABLATE study signifies a major leap in lung cancer treatment, establishing transbronchial MWA as a viable, less invasive alternative. Its high success rate and minimal complications mark it as a potential game-changer for patients with limited treatment options. The results pave the way for future studies and the potential widespread adoption of this technique(2).

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WABIP ACADEMY- WEBCASTS

The WABIP has started a new education project recently: *THE WABIP ACADEMY*. The WABIP Academy will provide free online webcasts with new and hot topics that will interest pulmonologists and interventionalists.


Current webcast topic: **Tissue acquisition for biomarker directed therapy of NSCLC**

Webcast

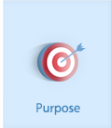
Small Sample Tissue Acquisition and Processing for Diagnosis and Biomarker-driven Therapy of NSCLC

Welcome to WABIP's free online learning tool to increase knowledge regarding the appropriate selection, acquisition, and processing of cytology and histology samples from patients with known or suspected lung cancer.

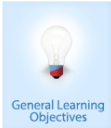
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Program Description



Purpose



General Learning Objectives



Specific Learning Objectives


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Each fictitious clinical case scenario is based on a conglomerate of real patient data. Cases have been modified to avoid any possibility for patient identification and to help meet educational objectives. Any resemblance to real persons, living or deceased, is purely coincidental.

The content for these webcasts has been developed by members of the World Association for Bronchology and Interventional Pulmonology. All content was reviewed by an independent multidisciplinary team of experts. Unless otherwise specified, all content is the property of WABIP.

A collaborative project with Pfizer Oncology

[Credits >](#)



You can reach these webcasts by using this link: <http://www.wabipacademy.com/webcast/>

Links

www.bronchology.com	Home of the Journal of Bronchology	www.chestnet.org	Interventional Chest/Diagnostic Procedures (IC/DP) NetWork
www.bronchoscopy.org	International educational website for bronchoscopy training with u-tube and facebook interfaces, numerous teaching videos, and step by step testing and assessment tools	www.thoracic.org	American Thoracic Society
www.aabronchology.org	American Association for Bronchology and Interventional Pulmonology (AABIP)	www.ctsnet.org	The leading online resource of educational and scientific research information for cardiothoracic surgeons.
www.eabip.org	European Association for Bronchology and Interventional Pulmonology	www.jrs.or.jp	The Japanese Respiratory Society
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END0 90992 AA

This article has summarized the historical advances in the design and performance of needles used for EUS-guided procedures. Since the early 1990s, EUS-FNA has played a clear and vital role in oncological care and has become the standard procedure for sampling tissues with high diagnostic accuracy.

Reference:

Current Status of Needles in the Optimization of Endoscopic Ultrasound-Guided Procedures.

Akashi Fujita, Shomei Ryozaawa *, Yuki Tanisaka, Tomoya Ogawa, Masahiro Suzuki, Tatsuya Noguchi, Hiromune Katsuda and Masafumi Mizuide Department of Gastroenterology, Saitama Medical University International Medical Center, 1397-1, Yamane, Hidaka, Saitama 350-1298, Japan