

Jakarta Head and Neck Oncology Surgery Priority Score (Ja-HOP)

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ABSTRACT

COVID-19 Pandemic has made a major change in the health care system including oncologic services. Elective surgery was mostly delayed to preserve resources and decreased COVID-19 transmission. Head and neck oncologic surgery will often be classified as “urgent” surgery and need special management in the current policy restrictions. We provide a score-based system for prioritizing head and neck surgery during the pandemic in the Indonesia setting. Several categories of considerations are made as a priority including tumors type and staging, outcomes following the delay in head and neck cancer therapy, airway, the population affected, patient location, and risk of transmission during otolaryngologic surgery. All categories were translated into a 3-point based specific subcategory score system with a maximum score is 27 and applied to each surgery candidate. The system also included a timeframe in which the physician should reconsider medical treatment if surgery were still not feasible. We applied the Ja-HOP score in our institution and compare patient treatment characteristics before and after implementation. 14 patients (10 curatives, 4 diagnostics) have elective surgery in June 2020 versus 18 patients (15 curatives, 2 diagnostics, 1 follow-up) in May 2021 after implementation. 11 patients have identified high Ja-HOP score (>20), 2 patients were converted to medical and palliative treatment after being assessed with Ja-HOP because of an advanced case. Ja-HOP Score is useful as an objective tool for managing surgical head and neck oncologic patients in our setting. This system will most beneficial for patients and decrease surgeon subjectivity that is prone to the conventional method.

Keywords: Head and Neck Oncologic, Surgery, Priority Score.

1. INTRODUCTION

The COVID-19 pandemic has made pressure on health services worldwide thus requiring strategy modification of treatment paradigms in head and neck oncology. Most head and neck cancers require urgent management, as extended delays may result in additional morbidity or even death. For all subsites (oral cavity, oropharynx, larynx/hypopharynx), there was not a significant increase in mortality when patients initiated treatment within 30 days; however, for each additional 30-day delay, there was a 4.6% increase in the overall survival hazard ratio [1]. Surgery has been considered as a first-line treatment option for certain Head and Neck Cancer. However, the latest data advised that head and neck oncologic surgery may be less advisable in some

conditions, imprudent, due to a confluence of extraordinary, co-occurring, rapidly evolving, COVID-19-related circumstances [1], [2].

The risks of surgery must be considered of the potential impact on patients, providers, and Health Care Workers, and health care institutions, and society. Head and neck oncologists surgeon must also:

1. Protect the patient from infection with SARS-CoV-2 as well as minimizing risk factors for COVID-19-related fatality in the event of infection.
2. Prevent the spread of COVID-19 within healthcare institutions and the community.
3. Minimize the risk of COVID-19 transmission to healthcare workers.

4. Fairly allocate resources to all patients in a time of scarcity [3].

There were some head and neck oncology surgery management strategies already available.

2. METHODS

Ja-HOP Score is based on a scoring system contributed by several factors adapted from several

international guidelines [4]-[8]. This system designed to be easy, transparent, and can be adaptable in various conditions in Indonesia and other developing country settings. The Ja-HOP score consists of 9 factors affecting priority, each factor attributed with 0-3 points and the maximal cumulative score is 27. Ja-HOP forms are provided in Table 1.

Table 1. Ja-HOP Score form

Score	Type	Airway problems	Subject	Surgery aim	Performance Score	length of treatment	Multi disciplinary	Complication	Access to hospital	Total score
3	<ul style="list-style-type: none"> Larynx Thyroid (anaplastic & medullary) Oral cavity and oropharyngeal and hypopharynx Salivary gland Advanced Sinonasal 	Airway problem cured by mass extirpation	Pregnancy	Curative	ECOG 3	<ul style="list-style-type: none"> Malignant >2 months Benign > 6 month 	≥ 3 division	<ul style="list-style-type: none"> life threatening Post surgery related problems 	Other city-no accommodation	
2	<ul style="list-style-type: none"> Sinonasal early and mid-stage Thyroid (papillary) Progressing Angiobroma Skin cancer 	Airway managed by tracheostomy	Pediatric	Diagnose	ECOG 2	<ul style="list-style-type: none"> Malignant 1-3 months Benign 3-6 months 	2 division	Moderate complication	Other city-with accommodation	
1	<ul style="list-style-type: none"> Benign tumours 	Patent airway	Productive	Palliative	ECOG <2	<ul style="list-style-type: none"> Malignant <1 month Benign < 3 months 	1 division	Mild complication	Same city	

There are several considerations in each category. The tumor factors consideration was chosen by the type, disease progression, prognosis, and also risk for complication of other organs. Airway consideration is important because patent airway conditions that may be

achieved with tumor mass extirpation can avoid tracheostomy in some conditions. We reserved emergency tracheostomy in emergency operating rooms. The goal of surgery is an important factor to consider in a limited surgery setting also considering if

there is alternative treatment available. The performance score was made according to the established ECOG score that was used in the NCCN guideline [9]. The length of treatment represents how long wait time factors since surgery decision and wait for surgical therapy. If surgery needs multi-surgeon collaboration we give it more priority based on difficult times to match each surgeon's schedule. The complications category is stratified based on vital organs and whether the surgery aim is related to a complication of previous treatment. We calculate access to our hospital as a factor contributing because most of our patients actually use government insurance but often had difficulty maintaining treatment because of accommodation problems that can impact disease outcomes.

Ja-HOP score assessment is applied in all surgery candidates and the list is made online so that all teams members can monitor and make a change if needed. The assessment is repeated every 2 weeks for malignancy and every 1 month for benign tumors. Offline consultation will be made if there is a sign of symptoms or disease progression and if the condition remains stable, the patient will conduct telemedicine consultation. If the Ja-HOP score is high but surgery is not feasible in an urgent time, the treatment plan is converted to an alternative option available such as concurrent chemoradiation.

We implemented the Ja-HOP Score in our patients within one month period and compared the surgical number with the Ja-HOP score retrospectively in the period before the implementation of Ja-HOP and also before the COVID-19 pandemic. The higher Ja-HOP score is considered more urgent and represents that surgeon can detect and perform surgery in more appropriate patients.

3. RESULTS AND DISCUSSION

3.1. Results

We applied the Ja-HOP Score in ORL-HNS Oncology Division Cipto Mangunkusumo General Hospital in the period May 2021 and compare patient treatment characteristics before and after implementation. This resulting 14 patients (10 curatives, 4 diagnostics) have elective surgery in June 2020 versus 18 patients (15 curatives, 2 diagnostics, 1 follow-up) in May 2021 after implementation. Eleven patients have identified high Ja-HOP score (>20) in May 2021 versus 5 patients in June 2020, two patients were converted to medical and palliative treatment after being assessed with Ja-HOP because of an advanced case and surgery is not available in short periods. The number of patients with Ja-HOP scores more than 15 in June 2020 is significantly lower than after Ja-HOP was implemented. For comparison before the pandemic situation in June

2019, we have 21 elective surgeries with 10 patients have >15 Ja-HOP Score.

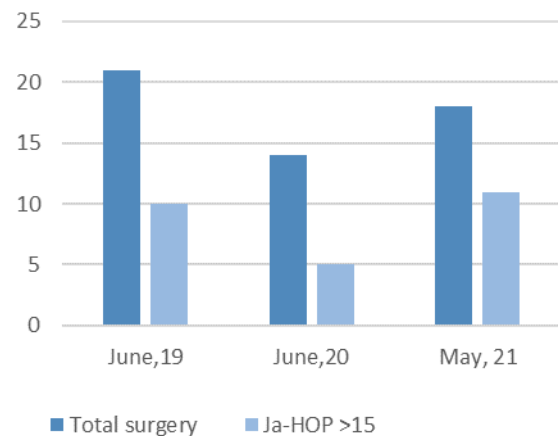


Figure 1. Comparison of surgery case before the pandemic, and in pandemic setting before and after implemented Ja-HOP Score (May 2021)

3.2 Discussion

Ja-HOP Score is an objective tool to make patient stratification for surgery specially designed for head and neck cancer in our setting. In the setting of the COVID-19 pandemic, in which the availability of operating room time, as well as hospital and intensive care unit beds, is limited, the prioritization of surgical oncology cases is imperative to mitigate downstream adverse outcomes. Creating COVID-19-era allocation schemas that are ethically sound is both critical and challenging. Emanuel et al [10] have advocated 4 ethical principles for allocation resources in a pandemic setting: 1) maximizing the benefits produced by scarce resources; 2) treating people equally; 3) promoting and rewarding instrumental value, and 4) giving priority to those patients who are worst off [10]. This score-based system can help to minimize bias in surgeons to choose patients that are appropriate to be prioritized.

In low-resource settings other previously defined factors such as time gap for receiving the treatment, accessibility of physical resources, and availability of human resources should be considered to select the best candidate from the available treatments. The surgeon has to decide whether to use their limited time for a rescueable patient with an early tumor or a patient with an advanced tumor and less possibility of long-term survival [11]. Ja-HOP can also be a warning tool to decide alternative procedures if surgery is still not possible. The adaptation of guidelines to low-resource settings is necessary to offer the best individual treatment without compromising the stability and survival of health systems. In the field of head and neck surgical oncology, postponing a surgery can

significantly impact survival due to the increased risk of cancer progression.

Using Ja-HOP Score has led to a significant shift in the management of patients with head and neck cancer at our institution. What makes Ja-HOP Score different than other stratification tools is Ja-HOP score is based on an objective scoring system so it will make surgery priority decisions easier and also there is a tool to warn surgeon that optional treatment must be performed when surgery is still not feasible. Patient monitoring is also an important part of Ja-HOP to improve patient safety and make the Ja-HOP score represent the actual condition of the patients. In an educational hospital setting like ours, the Ja-HOP score can assist team members in understanding the patient situation even when there is a change in team members. For the patient, Ja-HOP will benefit the patient to rule out surgeon subjectivity, and potentially improve patient disease outcomes in a time of limited head and neck oncology services. The Ja-HOP still needs more improvement with more time and patient but we think this scoring system will also provide benefit even after the COVID-19 pandemic situation.

This stratification system is still in early adoption hence may have limitations. This system will need evaluation after being implemented in larger patients and longer periods to improve the reliability. External validation will also define the acceptability in other health care settings. In the future, there will still need studies that target overall patient's prognosis, the satisfaction of surgeons and patients after implementing Ja-HOP Score. Nonetheless, the actual prioritization of surgical waiting lists remains the sole responsibility of the clinician and the teams.

Banjarmasin, the capital of South Kalimantan is known as a region that annually suffers from forest fire. Forest fire will produce a consistent smoke especially in dry season [7]. Study in Boston found that firefighter was the person who is susceptible to laryngeal malignancy although there is no history of smoking [14]. Some other professions who have high risk were gasoline station worker, wood processing worker, toxic dust exposure, and mineral industry worker [15].

The youngest age in the study was 38 years and the oldest age was 81 years with an average 59.04 years old. The most patients were in the age range between 61-70 years old (30.77%). This result was similar to previous results in other regions in Indonesia who have no history of forest fire [16]. The present finding was also comparable with the study in Africa [17].

The most genders that suffered from MLT in this study were men (96.15%). According to Markou et al., malignant tumors of the larynx are predominant diseases

in men, with the ratio between men and women was 30:1. Men were more likely to suffer from malignant laryngeal tumors due to smoking habits and alcohol consumption. Epidemiological data showed that smoking is the most important risk factor for the occurrence of malignant laryngeal tumors. Generally, the risk was related to the length of the habit and also the number of cigarettes used. Alcohol also plays an important role in the pathogenesis of malignant tumors of the larynx. It depends on the amount and duration of consumption of such alcohol. Based on research data, reducing/stopping smoking habits and alcohol consumption prevents malignant tumors of the larynx about 90% [12]. On the case of forest fire, men and women are at a similar risk to MLT. However, the finding on this study did not draw the relationship of MLT to this risk factor.

In this study, the main complaint was dyspnea in all patients. The most common sign in the study by Boci et al. was dysphonia (79.8%) followed by dysphagia (42.5%), dyspnea (25.4%), stridor (1.62%) and the rarest manifestation was fetor present only in 1 patient [17]. The common complaints found in MLT are usually dysphonia, dysphagia, odynophagia, sensations of stuck in the throat, respiratory disorders due to airway obstruction, blood clots, and pain [5]. Symptoms of MLT are affected by the location and size of the tumor [13]. Our results represent that the majority of the cases were in advanced stage. In addition, the low air quality due to annual forest fire may affect the dyspnea in our cases. However, an advanced study should be done to prove this hypothesis.

The most histopathological results in this study were well-differentiated squamous cell. This result is comparable with Markou et al. (2013) in Greece who found well-differentiated SCC in 43% cases [12].

Most of the patients in this study came in stage IV. This result is similar to the report by Kadriyan et al. [15]. On the other study found that patients mostly came at stage III followed by stage IV [17]. The majority of patients come at an advanced stage may be due to the patient's low socioeconomic status [3]. Stage will affect the life expectancy of the patients. On stages 1 and 2 may reach 90% 5 years survival rate, on the other hand, an advanced stage may only reach 30-50% [12].

The number of patients who can be recorded for the management of malignant tumors in this study is only 14 patients. Several factors may influence this finding such as the patient's choice, economic consideration, or the patient died before treatment given. Total laryngectomy is the most frequent treatment modality for primary tumors in advanced stages [3]. In our study, total laryngectomy alone was delivered to 8 patients (57.14%), followed by the other treatment modality.

The result of the present study was comparable with the research in Egypt [3]. On the other hand, the most common treatment reported by Boci et al (2020) was radiotherapy as a single treatment 359 cases (52.8%), followed by surgery and radio-chemotherapy consecutively 273 (37.7%) and 47 (6.9%) cases [15]. The recommended therapy for each patient depends on many factors such as the location of the primary tumor, the stage, the degree of differentiation, and the general condition of the patient. An early-stage tumors mostly can be treated either by radiation or surgery alone. Locally advanced tumors, especially those with the presence of clinical lymphatic, were need a multimodality treatment [17].

4. CONCLUSION

Ja-HOP Score is useful as an objective stratification tool for managing surgical head and neck oncologic patients in our setting. This system will most beneficial for patients and decrease surgeon subjectivity that is prone to the conventional method.

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