

**Archives of Surgical Research** | Covid-19 Special Feature**Endocrine Surgery during COVID-19 Pandemic: A Collective Review of Guidelines**

Muhammad Imran Khokhar, Muhammad Farooq Afzal, Shabbir Ahmad, Suleman Asif, Muhammad Zubair

**IMPORTANCE** Coronavirus disease (Covid-19) took pandemic status after outbreak in Wuhan, China, in December 2019. In Pakistan, first case of Covid-19 was reported on February 26th 2020. After striking peak during last week of June, it started declining in Pakistan. During next three months it declined rapidly as compared to other countries. Our aim is to evaluate the current recommendations based on review of literature that can help plan the surgery and protect both patients and healthcare workers, during and after pandemic.

**METHODS** We reviewed several papers on endocrine surgery during Covid-19 pandemic, published in leading journals. Different search engines were used including Google, Yahoo and Bing. Recommendations about optimal timing for endocrine surgery during Covid-19 pandemic were evaluated.

**RESULTS** As in other countries, all elective and non-emergency surgeries were postponed in Pakistan in mid of March 2020. Most of the endocrine operations can be postponed for a certain period of time. During the process of covid-19 spread, guidelines for safe surgery were established by leading endocrine surgical societies. Like other countries, surgeries were started in three stages in Pakistan. During early days of pandemic life-threatening surgeries were performed (First stage). Cancer surgeries were started when outbreak was being controlled (Second stage). Elective surgeries have been started recently with suppression of outbreak, taking all precautionary measures during surgery (Third stage).

**RESULTS & INTERPRETATION** The endocrine procedures need to be triaged according to the level of urgency and priority. In the light of guidelines from various endocrine surgical societies we may recommend that most of endocrine cases can be postponed to the third stage of the epidemic.

**KEYWORDS:** Endocrine surgery, Pandemic, Coronavirus, Covid-19

**HOW TO CITE:** Khokhar MI, Afzal MF, Ahmad S, Asif S, Zubair M. Endocrine Surgery during COVID-19 Pandemic: A Collective Review of Guidelines. *Archives of Surgical Research*. 2020;1(2):20-24. <https://doi.org/10.48111/2020.02.06>

**Covid-19 Special Feature**

**Author Affiliations:** Author affiliations are listed at the end of this article.

**Corresponding Author:**

Dr M Imran Khokhar  
Department of Surgery, Lahore  
General Hospital, Lahore  
[drmik10@gmail.com](mailto:drmik10@gmail.com)  
<https://doi.org/10.48111/2020.02.06>

**D**uring Covid-19 pandemic, number of infected patients increased gradually as in other parts of the world. After striking peak during last week of June, it started declining in Pakistan. Total cases reported till the last week of September 2020 were 0.31million with 6484 deaths. At the same time, worldwide reported cases were 34 million with 1.01 million deaths<sup>1</sup>.

Since early stages of pandemic, specific precautionary measures were recommended all over the world. This included hand sanitization, use of face mask and social distancing. Similarly, certain standard operating procedures (SOPs) were established for all surgical procedures including endocrine procedures. Various endocrine surgical societies have recommended specific SOPs for thyroid, parathyroid, pancreas, supra renal gland and neuroendocrine surgeries<sup>2-4</sup>. These measures are taken to minimize mortality and morbidity in high risk patients.

Endocrine societies of America, United Kingdom, Europe and Asia have developed protocols with a common aim of

optimal patient care by prioritization and triage. The variation observed among these societies in terms of SOPs, reflect the needs and demands of the healthcare system and needs. Generally speaking, during early stages of pandemic, only the patients of endocrine pathologies having life threatening problems were planned for surgery. Endocrine cancer surgeries were started when pandemic started declining. Benign endocrine surgeries have been started recently while pandemic has settled in most parts of the world. All precautionary measures were taken during all stages of pandemic to prevent the patient as well as surgical teams<sup>5</sup>. In Pakistan, we had similar approach for endocrine surgery at almost all centers across the country.

Below are guidelines proposed by international societies of Endocrine surgery:

**(A) AMERICAN COLLEGE OF SURGEONS (ACS)**

American College of Surgeons established certain guidelines and proposed Triage is divided in three phases<sup>3</sup>.

**Phase I**

(Few COVID-19 patients, hospital resources not exhausted, institution still has ICU ventilator capacity and COVID-19 trajectory not in rapid escalation phase)

*Surgery restricted to patients likely to have survivorship compromised if surgery not performed within next 3 months.*

Surgical cases that need to be performed as soon as feasible:

1. Thyroid cancer requiring acute airway management
2. Resectable anaplastic or poorly differentiated thyroid cancer without *BRAFV600E* mutation\*
3. Progressive/clinically aggressive differentiated or medullary thyroid cancer
4. Large suspected thyroid malignancy with documented progression
5. Large goiters with significant symptomatic airway compression\*\*
6. Suspected parathyroid carcinoma with significant symptomatic hypercalcemia
7. Suspected adrenocortical carcinoma
8. Medically uncontrolled hyperfunctioning endocrine tumors

Surgical cases that can be safely deferred:

1. Differentiated thyroid cancer\*\*\*
2. Medullary thyroid cancer\*\*\*
3. Indeterminate thyroid nodules without documented progression
4. Thyroid goiters\*\*
5. Primary hyperparathyroidism
6. Medically controlled hyperfunctioning endocrine tumors
7. Incidental, nonfunctional adrenal lesions

*\*Patients with anaplastic thyroid cancer with *BRAFV600E* mutations should be offered *BRAF/MEK* inhibitor therapy initially, and surgery can be deferred.(6)*

*\*\*Generally, mildly symptomatic airway compression from large goiters is subacute or chronic and does not require immediate intervention. Very rarely, a patient may present with significant and acute airway compromise, in which case surgery or airway intervention cannot be safely postponed.*

*\*\*\*Most differentiated and medullary thyroid cancers are slow-growing tumors that do not cause significant morbidity over the short term, although there is a subset of more biologically aggressive cancers that progress more rapidly. Therefore, clinical correlation with rate of progression (if known), size, invasiveness of surrounding structures, and proximity to critical structures is recommended.*

**Phase II**

(Many COVID-19 patients, ICU and ventilator capacity limited, and/or operating room supplies limited)

*Surgery restricted to patients likely to have survivorship compromised if surgery not performed within next few days.*

Surgical cases that need to be performed as soon as feasible:

1. Thyroid cancers requiring acute airway management
2. Resectable anaplastic or rapidly progressive poorly differentiated thyroid cancer without *BRAFV600E* mutation\*
3. Rapidly progressive/clinically aggressive differentiated or medullary thyroid cancers\*
4. Rapidly progressive adrenocortical carcinoma
5. Medically uncontrolled hyperfunctioning endocrine tumors
6. Suspected parathyroid cancer with significant hypercalcemia refractory to medical management

All other endocrine diagnoses can generally be deferred.

*\*Some anaplastic, poorly differentiated, and advanced progressive differentiated and medullary cancers require major surgery such as laryngectomy, tracheal resection, and/or sternotomy. These more advanced and complex cases should be considered in alignment with available hospital resources.*

**Phase III**

(Hospital resources are all routed to COVID 19 patients, no ventilator or ICU capacity, OR supplies exhausted)

*Surgery restricted to patients likely to have survivorship compromised if surgery not performed within next few hours.*

Surgical cases that need to be performed as soon as feasible:

1. Thyroid cancer requiring acute airway management
2. All other endocrine diagnoses are deferred.
3. Alternative treatment approaches for endocrine neoplasia for which surgical intervention is deferred due to COVID-19 pandemic:
4. Most surgeries for thyroid nodules, thyroid goiters, differentiated thyroid cancers, and medullary thyroid cancers and adrenal nodules can be safely deferred without need for medical therapy
5. Consider TSH suppression for differentiated thyroid cancers
6. Anaplastic, poorly differentiated, or progressive/advanced differentiated and medullary

thyroid cancers with targetable mutations may be candidates for targeted systemic therapy

7. Optimize medical management of hyperfunctioning endocrine tumors (thyroid, parathyroid, and adrenal)
8. Coordination of care with other health care providers/facilities according to resource availability and travel restrictions

### **(B) BRITISH ASSOCIATION OF ENDOCRINE AND THYROID SURGEONS (BAETS)**

The risk of contamination to COVID-19 negative patients and healthcare workers, hospital facilities, especially the conditions regarding the operating room and postoperative care should be considered while planning for surgery during COVID-19 pandemic<sup>6</sup>. During pandemic period, the plans and recommendations made on this subject were based on expert opinions by considering factors, such as the course and biology of the disease, rather than being evidence-based. The proposal by the British Association of Endocrine and Thyroid Surgeons (BAETS) for the timing of the surgery, related to the urgency and priority of endocrine surgeries during the pandemic seems practical and feasible<sup>7,8</sup>.

Endocrine surgeries are divided into following four priority levels by British Association of Endocrine and Thyroid Surgeons (BAETS);

**Level 1a:** Life-threatening situations that need to be operated within 24 hours to save the patient

**Level 1b:** Conditions that need to be operated between 24-72 hours for life-threatening conditions that may cause, such as obstruction, bleeding, local or regional infection, permanent injury/clinical harm from the progression of conditions, such as spinal cord compression

**Level 2:** Conditions requiring elective surgical intervention and where surgery can be postponed safely for up to four weeks before a negative condition develops

**Level 3:** Conditions in which elective surgical intervention can be postponed for up to three months without a predicted negative outcome

**Level 4:** Conditions in which elective surgical intervention can be postponed more than three months without a predicted negative outcome

Not only endocrine surgical interventions but also other elective surgeries had to be planned especially after the peak period of the COVID-19 pandemic. For this, all operations needed to be arranged in a certain order according to the hospital's facilities. So, it was recommended to classify and prioritize all postponed cases according to their specificities, such as cancer and transplantation, arranging all other surgeries according to an objective scoring system, and create an appointment plan according to this scoring<sup>2,9</sup>.

### **(C) FRENCH-SPEAKING ASSOCIATION OF ENDOCRINE SURGERY (AFCE)**

Specific guidelines have been proposed by the French-speaking Association of Endocrine Surgery (Association Francophone de Chirurgie Endocrinienne- AFCE) for the surgical management of thyroid, parathyroid, endocrine pancreas and adrenal pathologies during the COVID-19 epidemic and afterwards<sup>10</sup>.

#### **General principles for scheduling surgery during and after the COVID-19 pandemic**

Endocrine surgery is prioritized as four scheduling levels:

1. **Urgent surgery** that must be carried out as soon as possible because even a short deferral would be life-threatening;
2. **Semi-urgent surgery** that can be deferred for a few weeks but not beyond 3 months without threat to life or adverse effects on cancer or functional prognosis;
3. **High-priority elective surgery** that can wait for several months but must be given scheduling priority as soon as the epidemic is over;
4. **Distant elective surgery** that can be deferred until well after the epidemic is over, even more than 6 months, without compromising the indication.

The benefits versus risks must always be evaluated during emergency surgery planning keeping in mind that how both the national and local contexts are evolving, in particular the resources available: operating room, consumables and hospital capacities, particularly if intensive care may be needed. During epidemic setting, short hospital stays or outpatient care is recommended while prescribing surgery<sup>10</sup>. The surgery should be performed by one or more experienced surgeons to limit operating time and postoperative complications. To prevent unfavorable prognosis, the risk of infection should be assessed before surgery even if no symptoms of COVID-19 are apparent<sup>11,12</sup>. All surgeries on a patient infected or suspected of being infected must be performed according to the SOPs for the management of these patients<sup>10</sup>.

#### **Postoperative follow-up in the epidemic setting**

Most of the teaching hospitals of country established telemedicine facilities for the optimal care of patients including endocrine surgery patients. Although, Outpatient departments started working in our country with all precautionary measures, telemedicine still has a role in pre-operative and post-operative care of endocrine surgery patients. Following are few of the recommendations:

- Postoperative follow-up consultations need to be maintained during the epidemic. Tele-consultation is recommended to ensure continuity of care while limiting the risks of coronavirus spread in healthcare centers.

## BAETS Prioritisation advice for Adult Endocrine Surgery during Covid-19 crisis

Priority level	1a	1b	2	3	4
Thyroid	Acute Airway Obstruction from Thyroid pathology		Tumour or goitre causing mild or moderate stridor  Undifferentiated /poorly differentiated thyroid cancer amenable to surgical treatment  Medullary thyroid cancer  Thyroid cancer with metastatic nodal disease  Uncontrolled thyrotoxicosis where medical treatment or radio iodine not suitable  Uncontrolled Graves' in Pregnancy  Patients with sight threatening thyroid eye disease	Other thyroid cancers (including diagnostic lobectomy)	Surgery for uncomplicated benign thyroid disease
Parathyroid			Hyperparathyroidism associated with corrected calcium > 3.0 mmol/l who cannot be controlled with medical management  Suspected parathyroid carcinoma.  Repeated hospital admissions for medical management of hyperparathyroidism  Pregnant women with significant hypercalcaemia (C.Ca> 2.85mmol/L) ideally in 2 <sup>nd</sup> trimester  Post Transplant hypercalcaemia with deteriorating renal function	Patients with recurrent and symptomatic renal stones +- associated sepsis	Other parathyroid surgery
Adrenal			Adrenal Cancer or Highly Suspicious Masses – includes malignant pheochromocytoma  Indeterminate Masses > 6cm especially those that have been shown to be increasing in size or hot (and non-functional) on PT scan  Adrenal pathology requiring urgent surgery for severe endocrine complications e.g. refractory Cushing's; Pheochromocytoma with heart failure	Indeterminate Masses > 4cm, < 6cm with adrenal androgen excess or cortisol hypersecretion  Adrenal Metastases -Rescan at 3 months and re-prioritise if progressing	Other adrenal surgery

**Priority level 1a** Emergency - operation needed within 24 hours to save life . **Priority level 1b** Urgent - operation needed with 72 hours

Based on: urgent / emergency surgery for life threatening conditions such as obstruction, bleeding and regional and / or localised infection permanent injury / clinical harm from progression of conditions such as spinal cord compression

**Priority level 2** Surgery can be safely deferred for up to 4 weeks - elective surgery with the expectation of cure

Based on: urgency of symptoms / complications such as local compressive symptoms / biological priority (expected growth rate) of individual cancers

**Priority level 3** Surgery that can be delayed for up to 3 months with no predicted negative outcome

**Priority level 4** Surgery that can be delayed for more than 3 months with no predicted negative outcome

**Disclaimer:** This document is intended to help BAETS members when planning services during the Covid-19 pandemic. It will be subject to change and updating over time. It is not comprehensive, and members should take into account other healthcare resources when planning services. The legal responsibility for local decisions is through local governance structures and local healthcare organisations. No liability is accepted by BAETS, including the BAETS executive team, other contributors to this document, and those undertaking work on behalf of BAETS to distribute this document, for any errors or omissions in this document, or for any direct or indirect loss to third parties related to the advice given in the document.

- Video exchange is recommended in the conditions requiring diagnosis and detailed instructions regarding postoperative care of the patient.
- Most of the investigations must be performed outside hospitals.
- In a situation where medical drugs of major therapeutic importance may be in short supply, patients, who are dependent on a hormone

substitution treatment, should be reminded never to interrupt their treatment longer than 24 h for corticoids<sup>13</sup>, longer than 48 h for calcium<sup>14</sup>, and longer than one week for thyroid hormones<sup>15</sup>.

#### CONFLICTS OF INTEREST:

The authors declare that there are no conflicts of interest regarding the publication of this paper.

#### ARTICLE INFORMATION

Accepted for Publication: May 26, 2020. Published Online: June 30, 2020. <https://doi.org/10.48111/2020.02.06>; Open Access: This is an open access article distributed under the terms of the CC-BY License. © 2020 Khokhar et al, ASR.

Department of Surgery, Lahore General Hospital, Lahore  
([imrankhokhar@gmail.com](mailto:imrankhokhar@gmail.com))

**Financial Support and Sponsorship:** Nil.

**Conflicts of Interest:** There are no conflicts of interest

#### REFERENCES

1. Coronavirus in Pakistan - Confirmed Cases. *covid.gov.pk/*. <http://covid.gov.pk/>. Accessed October 2, 2020.
2. Clinical Issues and Guidance. <https://www.facs.org/covid-19/clinical-guidance>. Accessed October 2, 2020.
3. COVID-19: Guidance for Triage of Non-Emergent Surgical Procedures. <https://www.facs.org/covid-19/clinical-guidance/triage>. Accessed October 2, 2020.
4. COVID-19 Guidelines for Triage of Cancer Surgery Patients. <https://www.facs.org/covid-19/clinical-guidance/elective-case/cancer-surgery>. Accessed October 2, 2020.
5. Fillingham YA, Grosso MJ, Yates AJ, Austin MS. Personal Protective Equipment: Current Best Practices for Orthopedic Teams. *J Arthroplasty*. 2020;35(7):S19. doi:10.1016/j.arth.2020.04.046
6. Herron JBT, Hay-David AGC, Gilliam AD, Brennan PA. Personal protective equipment and Covid 19- a risk to healthcare staff? *Br J Oral Maxillofac Surg*. 2020;58(5):500. doi:10.1016/j.bjoms.2020.04.015
7. <https://www.baets.org.uk/wp-content/uploads/2020/05/BAETS-Prioritisation-Advice-Final-05-2020.pdf>. Accessed October 2, 2020.
8. Stack BC, Tolley NS, Bartel TB, et al. AHNS Series: Do you know your guidelines? Optimizing outcomes in reoperative parathyroid surgery: Definitive multidisciplinary joint consensus guidelines of the American Head and Neck Society and the British Association of Endocrine and Thyroid Surgeons. *Head Neck*. 2018;40(8):1617-1629. doi:10.1002/hed.25023
9. Søreide K, Hallet J, Matthews JB, et al. Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services. *Br J Surg*. 2020;107(10):1250-1261. doi:10.1002/bjs.11670
10. Baud G, Brunaud L, Lifante JC, et al. Endocrine surgery during and after the COVID-19 epidemic: Expert guidelines from AFCE. *J Visc Surg*. 2020;157(3):S43-S49. doi:10.1016/j.jviscsurg.2020.04.018
11. Lei S, Jiang F, Su W, et al. Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection. *EClinicalMedicine*. 2020;21. doi:10.1016/j.eclinm.2020.100331
12. Liang W, Guan W, Chen R, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol*. 2020;21(3):335-337. doi:10.1016/S1470-2045(20)30096-6
13. Arlt W, Allolio B. Adrenal insufficiency. In: *Lancet*. Vol 361. Elsevier Limited; 2003:1881-1893. doi:10.1016/S0140-6736(03)13492-7
14. Smith A. Misconceptions in Evaluation and Treatment of Calcium Abnormalities and Parathyroid Disorders. *Physician Assist Clin*. 2017;2(1):141-153. doi:10.1016/j.cpha.2016.08.011
15. Tsai S-H, Chien S-C, Nguyen P-A, et al. Incidences of Hypothyroidism Associated With Surgical Procedures for Thyroid Disorders: A Nationwide Population-Based Study. *Front Pharmacol*. 2019;10:1378. doi:10.3389/fphar.2019.01378