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EDITORIAL

Centralization of Complex Cancer Surgeries in India: a Difficult Road

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The World Cancer Day celebrated on the 4th of February led by the UICC aims to create greater awareness, preventing, detecting, and treating cancer on a global platform. This year marks the first year of a 3-year campaign aiming to raise awareness and reduce inequity in cancer care being centered on the theme *"Close the Care Gap"* [1].

This year's theme is strikingly relevant in the Indian context wherein approximately 70% of the Indian population lives in rural India with minimal, if any, cancer care support. Almost 95% of cancer care facilities including Tertiary Care Centers (TCC) and specialist doctors are in urban India. Hence, not surprisingly, though the incidence of cancer in rural India is nearly half of that of urban India, the mortality rates are double [2]. Poor access to healthcare facilities in rural areas coupled with socioeconomic factors and lack of awareness about the disease result in delayed diagnosis and treatment and hence poor prognosis underscoring the need to *"Close the Care Gap."*

Benefits of Centralization

Luft et al. in 1979 reported the first volume-outcome relationship in surgery and supported regionalization for certain operations. This was followed in the 1990s by several publications highlighting better surgical outcomes in high-volume centers especially for complex esophageal resections and pancreatectomies. In the UK, the landmark "Calman-Hine" report (1995) recommended that cancer surgery should be limited to specialist high-volume units [3]. In the USA, programs to improve the quality of care were initiated by the Leapfrog Group, which is a non-profit organization that collects and transparently reports hospital performance using volume criteria or, more recently, using "public reporting" and "pay for performance" principles thereby enabling consumers to make informed decisions. Similarly, in Canada, the Surgical Oncology program within the Cancer System Quality Index (CSQI) has reduced case fatality following pancreatic resection. In The Netherlands, the Dutch Health Care Inspectorate is introducing the so-called performance indicators of care [4].

Birkmeyer et al., in their landmark publication, reported that surgeon-volume accounted for a large proportion of the apparent differences in operative mortality between high-volume and low-volume hospitals: it was 54% for pancreatic resection, 46% for esophagectomy, and 24% for lung resection. The authors concluded that patients can often improve their chances of survival substantially, even at high-volume hospitals, by selecting high-volume surgeons [5]. The best results follow high-volume surgeons.

Mehta et al. analyzed the outcome of 13,256 patients who underwent liver and pancreatic cancer surgery in Dedicated Cancer Centers (DCC) versus non-DCC. Only about 7.0% of these patients were treated at DCC. Overall complications, 90-day readmission and 90-day mortality including long-term hazards of death were significantly lower at DCCs versus non-DCCs. In addition, total costs per patient were significantly lower for liver resection and comparable for those undergoing pancreatic surgery. DCC thus provided a higher quality of care at the same or lower costs, i.e., high-value care with lower failure-to-rescue rates [6]. Healthcare providers and/or insurance companies are nowadays selecting hospitals delivering "high-value care" for various surgical procedures.

Another study reported centralization to be associated with lower rates of postoperative complications and death for lung resection, esophagectomy, and pancreatectomy but not with significantly better outcomes for colectomy or proctectomy [7].

Challenges Associated with Centralization

A recent meta-analysis on the subject was published in 2021 by Grilli et al. [8]. Overall, 14 studies were included in the meta-analysis with 16 observations: 6 for

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esophageal, 5 for pancreatic, 3 for gastric, and 1 each for lung and colon cancer surgery. Although the findings indicated that centralization of cancer surgery leads to low postoperative mortality, it also significantly impacted the number of hospitals offering the surgery of interest with a median relative reduction of 63% (range 18 to 83%), while the proportion of patients treated at high-volume hospitals increased by a median of 17% (range 5 to 38%). This is especially relevant in the Indian scenario as the number of TCCs is extremely meager, located in far-off cities and the sheer population of the country.

Furthermore, the centralization of specialist surgical services and it is implementation may not be practical in all countries. A systematic review assessing the costs of centralization suggested that centralized services increase the costs of accessing care for patients and their caregivers. Also, a system of mandatory such as referrals would disadvantage patients who live far off making travel and stay logistically difficult and at times economically unsustainable. Moreover, there can be significant treatment delays as other hospitals may be reluctant in making referrals. Australia, for example, has a small and widely dispersed population. Various studies have reported good outcomes following pancreaticoduodenectomy (PD) from low to medium-volume Australian tertiary care centers. An outcome-based retrospective analysis of 53 PD for periampullary carcinoma carried out over a period of 14 years in a HPB unit of a tertiary care teaching hospital revealed an overall mortality of 3.8%. The morbidity rates and the oncologic outcomes were similar to those in high-volume units. The authors concluded that PD can be safely performed in a low-volume specialized unit at centers where amenities, expertise, and processes at high-volume centers can be replicated to ensure safety and high quality of care [9].

India (with about 36 Cancer Centers and 1 National Cancer Institute) has its unique set of problems and centralization though desirable would be a formidable task. Nearly 66–70% of India's population resides in rural areas with little or no access to specialized health care. Cancer diagnosis and treatment have catastrophic implications for India's poor. Approximately 40–60% of the treatment costs of cancer hospitalization are financed through borrowings, sale of assets, and contributions from friends and relatives and at times may exceed 20% of their annual per capita household expenditure [10, 11].

Hence, in a resource-limited populous and socioeconomically weak country such as India, more emphasis has to be paid to government insurance schemes covering the poor, more accessible, and well-equipped cancer hospitals in tier II and III cities under the overview of TCCs ensuring delivery of high-quality cancer care in low-volume centers under a strict framework with frequent quality and outcome checks. A step towards the same was initiated when the National Cancer Grid (NCG) was formed in August 2012 (funded by the Government of India through the Department of Atomic Energy). At the same time, it is of utmost importance to strengthen the community health network in rural areas; the latter has been immensely successful in implementing vaccination and other maternal and child health welfare activities in rural India and to cover the less privileged section of our society through Central and State Government-funded welfare schemes. The Ayushman Bharat Yojana, also known as the Pradhan Mantri Jan Arogya Yojana (PMJAY) launched by Prime Minister of India Shri Narendra Modi, is an ambitious scheme that aims to help economically vulnerable 10 crore poor families who are in need of healthcare facilities through a health insurance scheme providing a cover of Rs. 5 lakh per family. Several other government-funded schemes are also functional across India [11].

However, it cannot be denied that highly qualified medical professionals prefer to stay in urban cities with access to highly equipped hospitals, handsome remuneration, and a better quality of life. The cancer hospitals in tier II and III cities struggle to retain super-specialist professional staff and often have to depend on rotation postings from a major TCC. It is, therefore, imperative to strengthen our District Cancer Control Programme (DCCP) and National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) with periodic assessments so that cancer awareness and proper guidance for diagnosis and treatment reaches every doorstep. The Government of India has already laid a framework for population-based screening for non-communicable diseases namely diabetes, hypertension, and common cancers (oral, breast, and cervix) that has been expanded to more than 400 districts and it needs to be implemented by appropriately trained primary health care team [11, 12].

Conclusions

Comprehensive cancer treatment at TCCs/Cancer Institutes/hospitals with Departments of Surgical/Medical/Radiation Oncology undoubtedly results in better outcomes for the management of cancer requires multidisciplinary teamwork. These high-volume hospitals with state-of-art infrastructure and an experienced team are better equipped to deliver complex perioperative care after high-risk surgeries and offer complete cancer treatment involving adjuvant/ neoadjuvant therapy. But, such centers are too meager to cover the entire population of our country plagued with socioeconomic, gender, age, lack of cancer awareness, and other biases severely limiting access to optimal healthcare and thereby resulting in frequent dropouts. Thus, although evidence does suggest the best patient-related outcomes in high-volume dedicated

cancer centers, a mandatory centralization of services could have serious implications and the same needs to be tailored to the current status of a nation and its population.

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