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## CASE REPORT

# History of Laparoscopic Surgery in the English-Speaking Caribbean and Progress Amidst a Mix of Challenges and Opportunities

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## ABSTRACT

This discursive paper recounts the history of laparoscopic surgery in the English-Speaking Caribbean since the first recorded procedure in 1991. We discuss the challenges faced by early laparoscopic surgeons and analyze how they seized opportunities to overcome barriers against laparoscopy. This paper is important as it can serve as a template for the development of laparoscopic surgery in other low-resource areas across the globe.

## Introduction

Many authors have written about the challenges of delivering surgical care in low and middle-income countries (LMICs) in the English-speaking Caribbean [1-7]. Although laparoscopic and robotic surgery are well accepted and rapidly advancing in high-income countries [8,9], the English-speaking Caribbean continues to struggle with minimally invasive surgery (MIS).

The aim of this paper was to review the history of laparoscopic surgery in the English-speaking Caribbean. We also discuss the progress of MIS and analyze the ground gained amidst the challenges and opportunities that exist in English-speaking Caribbean LMICs.

## Methodology

This is a discursive paper that recounts the history and progress of laparoscopic surgery in the LMICs in the English-speaking Caribbean.

### CURRENT STATUS OF LAPAROSCOPIC SURGERY:

Although MIS was introduced to the English-speaking Caribbean in 1991 [10], this was followed by a period of stagnation for almost two decades [11]. During this time, very little MIS was performed throughout the region. There were few nations where MIS was performed in small, highly selected pockets, but the majority of LMICs had no real access to this service [1,6,10,11,12,13,14].

In the year 2010, concomitant with the repatriation of several MIS-trained surgeons to the region [3,4], there was an increase in the number and complexity of laparoscopic cases across the region. But it was clear that the region continued to struggle. For example, in the year 2012, only 23% of cholecystectomies were attempted laparoscopically in the most populous nation in the English-Speaking Caribbean [15]. There is little published data to document the utility of MIS across the region from 1991 to 2010, and that in itself is testimony to the unpopularity of MIS in that period.

Currently, there are many published reports of MIS being used across the region, but they are still mostly originating from the more populous LMICs [1,3,11,12,13,14,15], and there is not widespread availability of MIS to the population at large in the English-Speaking Caribbean.

## Statement of the Problem:

Although the English-Speaking Caribbean is comprised of approximately 7.5 million persons, the population is scattered over 17 nations across a wide geographical area, separated by large swathes of the Caribbean Sea [1]. Many of these are independent nations with their own Governments, healthcare budgets, and independent healthcare systems. This creates several problems:

### A. DIFFICULTY ATTRACTING SUBSPECIALISTS:

The population of each LMIC is small, numbering <100,000 persons in 76% of English-Speaking Caribbean nations [1]. Some nations have populations as small as 5000 persons [1]. With small populations and limited healthcare budgets, many small nations find it difficult to attract subspecialty-trained surgeons. Laparoscopic surgeons may not wish to work in low-volume settings where they may de-skill and the financial remuneration is less lucrative than that in developed nations. Therefore, the reality is that most of the less-populous LMICs in the English-Speaking Caribbean have no resident laparoscopic surgeons.

### B. LIMITED HEALTHCARE FUNDING:

Many of the LMICs in the English-Speaking Caribbean can only afford to devote a small proportion of their annual budget to healthcare [3]. The Pan American Health Organization (PAHO) reported that average public health expenditure is approximately 4% of the gross domestic product for the region [16].

Tenuous funding limits the availability of intensive care unit (ICU) beds, monitoring equipment, blood banking stores, personal protective equipment, surgical consumables as well as laparoscopic equipment [2,4,6,7]. Therefore, surgeons work in a difficult atmosphere under constant pressure to "conserve precious resources". Therefore, many patients end up having open surgery even when they are candidates for MIS.

### C. SCARCE LAPAROSCOPIC EQUIPMENT:

Narayansingh et al. [1] reported that as recent as the year 2014, laparoscopic equipment was only available in 26% of public hospitals in all English-Speaking Caribbean nations. This means that 74% of LMICs in the Caribbean cannot offer their patients laparoscopic surgery, even if the expertise did exist.

In addition, maintenance of laparoscopic equipment is often not prioritized in English-Speaking Caribbean hospitals. Perry et al [17] reported that 40-60% of hospital medical equipment in developing countries "was out of service".

#### D. DEFICIENCIES IN SURGICAL LEADERSHIP:

Many authors have explained how deficient surgical leadership stifled the development of MIS in the English-Speaking Caribbean [6,18,19]. This is no different to the situation in Germany when Prof. Erich Muhe was dismissed by the German Surgical Society Congress after introducing laparoscopic surgery [20], but similarly, it does apply long-lasting drag on surgical progress.

Health care management requires the direction of institutional resources and professional groups to promote population health. It requires training in healthcare leadership and management. One of the problems in English-Speaking Caribbean LMICs is that there is a limited cadre of persons to fill leadership positions. Therefore, in many instances, candidates are selected to fill management posts based on seniority, clinical experience, or political affiliation, rather than formal training in healthcare management [19]. These surgical leaders who have no formal training lack the emotional intelligence and leadership skills described by Goleman et al [21] and are unequipped to effectively steer the healthcare systems.

Imagine the possibility that persons chosen based on seniority would likely not have MIS training and that these persons are given control over institutional resources in order to direct health care delivery. It is easy to appreciate the conflict of interest. Instead of uniting those they lead, they may use administrative powers to erect barriers and marginalize younger surgeons, fueling their outward migration from the healthcare systems [22,23].

Money et al [22] published an insightful report on the differences between generations of surgeons. They pointed out that most current surgical leaders belong to the baby boomer era (born between 1945 and 1964) and differed from young surgeons in generations X and Y in life philosophies, work ethic, sources of motivation and expectations. These factors create a

disconnect between leaders and surgeons in the later generational groups, making it difficult for an individual to lead a group of persons with whom they cannot identify [22].

If we put this into context, we must recognize that most progress in MIS occurred over the past two decades, and many of the current surgical leaders would have had little MIS exposure during their training. Therefore, it might be an unreasonable expectation to expect them to support and encourage procedures that they themselves may not be able to perform and may not fully understand [22].

Cawich et al [18] pointed out that the surgical leader must accept that they will become outdated far more rapidly than their predecessors or contemporaries in other fields. The MIS surgeons who trained in the early 21st Century, for example, would have already lost ground unless they continued to learn advanced techniques such as single incision laparoscopy (SILS), natural orifice transluminal endoscopic surgery (NOTES), and robotics. On top of that, they may be required to support their juniors who, in a short time, may be able to do things that even the young leader cannot do [18]. This is a serious challenge to the psyche of even the most mature surgical leader. Therefore, humility [22,23] and charisma power (influence through personal character) [24] are indispensable qualities of modern surgical leaders - again very different from the philosophies of earlier generations.

#### E. LIMITED OPPORTUNITIES FOR TRAINING IN MINIMALLY INVASIVE SURGERY

There are two medical universities providing post-graduate surgical training in the English-speaking Caribbean: The University of the West Indies (UWI) and the University of Guyana (UG) [11,14]. These universities prepare graduates for independent practice in the English-Speaking Caribbean. However, the universities have limited and unstructured exposure to MIS in their curricula up to the year 2023. Therefore, to get experience in MIS, aspiring surgeons are required to seek training in developed nations, contributing to a "brain drain" [25,26].

#### F. OUTWARD MIGRATION / "BRAIN DRAIN"

There is a well-documented problem of outward migration of healthcare workers to developed nations [25-30]. There are reports that 70-90% of

educated English-Speaking Caribbean persons end up migrating to North America [3,25,26]. This outward migration drains the region of potential expertise, making it difficult to retain quality staff within the healthcare delivery systems.

#### G. INTER-ISLAND COLLABORATION:

In the existing situation where many LMICs have a paucity of equipment and/or expertise, one would think that a rational response would be to facilitate surgeon and/or patient transfers within the region. Disappointingly, this has not been prioritized by policymakers in the English-speaking Caribbean. Surgeons are not free to move between the nations to provide badly needed healthcare. In order to do this, the surgeon is required to register in each LMIC, often with onerous registration requirements that limit the impetus to assist.

In this climate, surgeons in smaller nations have to either perform open procedures with little support or transport their patients to a distant island or developed country. In this case, the local healthcare systems do not have the opportunity for development.

### Solution

It is now clear that the LMICs in the English-Speaking Caribbean region have quite different work atmospheres to developed nations. Therefore, we have developed creative ways to work around these limitations in resource-poor environments:

#### A. ATTRACTING SPECIALISTS:

The success of a healthcare system rests on retaining trained, competent, and motivated staff. Unfortunately, the majority of surgeons who seek fellowship training in developed nations do not return to the Caribbean [3,4,11]. Many times, they are overwhelmed by the challenges of returning to work in the English-Speaking Caribbean, 'starting from scratch', lack of support from colleagues, and the insurmountable thought of working in an ailing system. McGaw et al [5] reported that the main reasons for operating room staff emigration were workplace dissatisfaction and insufficient work-related rewards.

We can examine this in the context of Abraham Maslow's hierarchy of needs theory [31], which identifies 'belonging' as the second most

important need after the most basic physiologic and safety needs are met. In the context of MIS, this is the desire to be accepted and appreciated by colleagues in the operating room who interact on a daily basis. We must strive to eliminate tenuous interpersonal relationships, poor communication, and human conflict that produce hostile environments not conducive to workplace satisfaction [18,32,33]. Generally, the surgical community should strive for fairness in the workplace and nurture a culture of freedom of expression, while avoiding racial, class, and gender discrimination [18,19,22].

Fredrick Herzberg's [34] adaptation suggested that employee motivation hinged on reward-recognition relationships (Maslow's ego-status need) and a sense of achievement (Maslow's self-actualization need). Caribbean LMICs may not have the financial resources for bonuses as reward power, but they can still use extrinsic motivators as simple as managerial praise, recognition ceremonies or even increased autonomy on the job to empower and motivate their staff.

#### B. HEALTHCARE FUNDING:

Healthcare funding is a complex issue. But the bottom line is that policymakers must recognize that long-term investment is needed in both human resources and equipment. We discuss the acquisition of equipment below. However human resource training is important for policymakers.

#### C. ACQUISITION OF LAPAROSCOPIC EQUIPMENT:

The start-up cost for MIS is high, but it is well accepted that laparoscopic surgery is cost-effective to the health care system in the long term [6,35,36]. Many healthcare funders may be reluctant to meet the financial demands of high start-up costs, but organized and effective lobbying from providers and users may help steer policymakers in the right direction.

Wilson et al [6] approached this problem through public-private partnerships. They were unable to get funding to start an MIS program and so worked in collaboration with industry-private companies agreed to provide consumables on consignment, donated consumables, and provided loaner equipment to start an MIS program in a government hospital [6]. Once it was demonstrated to be feasible, it was easier to get support and funding.

Another model is actively forming partnerships that do not need to be linked to funding. Through interpersonal relationships, we have formed links with developed nations to develop multidisciplinary team (MDT) processes and provide expertise [10,23]. When these links mature, they help to develop can open channels to receive used or decommissioned equipment and/or consumables.

Another model was used in Jamaica, where only basic laparoscopic equipment existed in public hospitals. MIS surgeons recognized that they needed consumables to work, and so offered their patients laparoscopy once they could independently procure consumables [4,19]. Although initially greeted with resistance, it was easily accepted once the system was shown to work.

Finally, we must recognize that hospital administrators answer to Governments, who in turn answer to the population. This is a powerful tool when used in the correct way. Recognizing this, Wilson et al [6] decided to provide free educational public lectures to the population at large on the benefits of laparoscopy. When the population became educated, they began to demand this service of the hospitals. When the public voice demanding MIS was loud enough, it supplemented the lobbying from MIS surgeons, and this put pressure on healthcare administrators to step up to the plate.

Wilson et al [6] stated that changing the perception of MIS at a national level would require support from surgical leaders and policymakers. Anecdotal experience suggested that lobbying from laparoscopic surgeons alone would not be sufficient, and this drove their plan to stimulate concurrent lobbying from end users of the healthcare system.

#### D. HONEST AND APPROPRIATE SURGICAL LEADERSHIP:

We have already made it clear that effective leadership is important because there is the potential for people to erect barriers to success when they feel threatened. We believe that it should be mandatory for the next generation of surgical leaders to have formal managerial training, and perhaps regional universities should integrate management courses into their post-graduate surgical degree courses for future generations.

We also believe that the existing tradition of selecting surgical leaders based on seniority, clinical experience or political affiliation should cease immediately. None of these criteria magically prepare surgeons to become good leaders or healthcare administrators. Instead of solving problems ineffective leaders may erect further barriers, demotivate surgeons, and exacerbate the "brain drain". We also advocate for mandatory continued training, regular performance evaluations, and enforcement of accountability for persons in formal leadership roles.

Effective leaders must recognize that they need cooperation from their staff [27], and this can only be achieved by mastering their own interpersonal interaction techniques. There must be less reliance on coercive power (a leader's influence through fear or the ability to punish employees) because it does not promote desired actions [37]. Instead, leaders should rely more on charisma power (the ability to influence through force of character). In English-Speaking Caribbean LMICs, this may be achieved by creating common interest groups, that would involve laparoscopic surgeons and give them a stake in the organization.

#### E. PROVIDE FORMAL OPPORTUNITIES FOR TRAINING IN LAPAROSCOPIC SURGERY

We previously pointed out that none of the institutions in the region incorporated formal MIS training. However, there are now many well-trained and proficient MIS surgeons in the English-speaking Caribbean to easily achieve this. If opportunities for MIS training are made available in the region, this could help to stem outward migration.

Interestingly, a unique situation has evolved in the English-Speaking Caribbean. In the early 21st century, open surgeons in leadership / administrative positions erected many barriers to implementation of MIS [4,6,11,15,18,38], but this had an unintended positive effect. When open surgeons occupying administrative positions did not allocate institutional resources to procure laparoscopic consumables (such as staplers), it forced MIS surgeons to develop their laparoscopic skillsets (such as intra-corporeal suturing) and increased their proficiency. These regional MIS surgeons have found ingenious ways to overcome other obstacles and understand existing challenges in the region.

Therefore, they are now perfectly poised to teach these techniques adapted to resource-poor environments to surgical mentees.

Alternatively, by simply taking the initiative to approach existing partners in developed nations to arrange fellowships or observer periods, regional surgeons and surgical leaders could help to increase trainee surgeons' motivation, self-worth, and workplace satisfaction.

#### F. SURGICAL MENTORING TRAINING

Calderon et al [39] recently published results of a survey that showed a major source of workplace dissatisfaction in the English-Speaking Caribbean was a lack of effective mentorship. If more regional surgeons became available as mentors, this could help to develop MIS. The ideal surgical mentor should have extensive training [40,41], experience [41], good technical skills [1,10,11,12], emotional intelligence [14,18,19], professional integrity [19,22], patience [18,42] and good communication skills [43,44]. This may also require formal training.

Three authors have made powerful statements to capture effective mentorship qualities: Singletary et al [45] suggested they "rejoice in the successes of their mentee, recognizing that their mentees may rise to greater levels than they did". Naraynsingh et al [1] wrote they "must expect their mentees to supersede their own performance in order to consider themselves successful." Cawich et al [38] stated that "effective and honest mentors should have sufficient emotional maturity to allow mentees to develop freely while assisting to maximize their potential". These three authors have made passionate statements, but they all capture the essence of good and effective mentors in surgery.

#### G. INTER-ISLAND COLLABORATION:

Currently, there is room for improvement in inter-regional collaboration in surgery. We have already made the point that, due to independent healthcare systems, specialists who are in high demand are not allowed to provide care to nearby countries. The medical registration systems are almost always onerous and prohibitive. Better Governmental collaboration to have regional registration may overcome this limitation. It is something that has been achieved before, with the inter-governmental cooperative body, the Organization of Eastern Caribbean

States (OECS), and the integrated currency, the Eastern Caribbean Dollar [46].

We believe it is important to identify common interest groups who share an interest in MIS and the unified desire to promote it regionally. In this regard, there are three common interest groups in the region: The Caribbean College of Surgeons (CCOS), the Caribbean Association of Endoscopic Surgeons (CaSES), and the Netherlands-Caribbean Foundation for Higher Clinical Education (NASKHO). By facilitating partnerships regionally and with international groups, these groups can assist with mentorship, support, and engaging members in the region who also operate in challenging Caribbean environments.

Another example of inter-island collaboration is to utilize workshops [1,12,13,14]. In this model, we have invited experts from the region to import expertise, rather than exporting a patient in need. By doing this, the entire healthcare system can improve their skill sets and results for a long-term investment. We have found that the industry is keen to support this and they have actively organized and funded training workshops in the region, with funding by Medtronic Latin America [12,13,14], Ethicon, and Karl Storz [1,47]. These workshops were invaluable to mentor entire surgical teams to develop MIS in their environments [1,12,13,14,47].

Cawich et al [48] introduced the concept of distance mentoring for advanced MIS, where a surgical mentor remotely facilitates another surgeon to perform procedures without physically being present in the operating room. The use of cheap and readily available equipment for distance mentoring was described in detail in prior publications [48,49]. In summary, a mentee surgeon performs an operation using two devices to allow the mentor to view the operative field and laparoscopic feed by live stream. They have shown that the technique could be used with 96% success and good outcomes in emergencies [49] and hepatobiliary surgery [50,51].

Robotic surgery would be a good solution since the operator console does not need to be in the same operating room. However, full robotic surgery remains non-existent in the Anglophone Caribbean up to the year 2024, largely due to

cost constraints. The FreeHand® robot (Freehand 2010 Ltd., Guildford, Surrey, UK) was introduced to the Caribbean in 2021 [47]. It was a robot with a single arm to control the laparoscope. The important point is that the technology was made possible through a private-public partnership between the Government of Trinidad & Tobago, Freehand 2010 Ltd. (Guildford, Surrey, UK), and a local distributor (AA Laquis Ltd). This once again reinforces our argument about the potential for partnerships in the region.

#### H. CRITICAL ASSESSMENT OF THE HEALTHCARE ENVIRONMENT

The Caribbean healthcare environment differs significantly from developed countries. We work in resource-poor settings with many challenges. We have found ways to overcome these challenges that may not be suitable for large, developing countries. We advocate, therefore, that surgeons must critically appraise their local hospitals and understand the pitfalls in their environment in order to introduce a policy that would maintain quality service delivery that suits the local healthcare environment [52].

#### I. REGULAR AUDITS AND CONTINUOUS MONITORING OF OUTCOME PARAMETERS

We must prioritize documentation because proper record-keeping is necessary in order to demonstrate tangible benefits for the health care system. Regular clinical audits are important instruments to ensure quality control by identifying ongoing problems and are prerequisites to achieving their solutions.

Continuous monitoring of outcome parameters is an essential part of substantiated quality control which would serve as the core data to audit, benchmark, and have as a dashboard function [53]. It is also imperative in the volume-quality privileging discussion in which the region and other LMICs will have to justify their work. Currently, work is ongoing to develop a continuous outcome-based monitoring system customized for the region, comparable to the American College of Surgeons' Surgeon Specific Registry system.

### Conclusion

The English-Speaking Caribbean healthcare environment differs significantly from developed countries. Caribbean surgeons have devised creative ways to overcome challenges and permanently incorporate laparoscopy into the

Caribbean surgical armamentarium. These maneuvers can be used as a template to develop minimally invasive surgery in other resource-poor environments.

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