Even Handed Future of Surgery—Ambidextrous, Serious Gamers with Innate Left Hand Laterality

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Received: 31 May 2016 / Accepted: 17 June 2016 / Published online: 22 June 2016
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“And what is good, and what is not good, need we ask anyone to tell us these things.” - Plato [1]

Harvey Cushing said, “The physician requires a special combination of head and heart, the surgeon, head, heart and hand” [2]. The hand and the handedness were thus made and have remained a debate in surgical domains. The surgical teachers constantly try to recruit the best and the brightest. At the same time, my generation, i.e., “Generation—Y” looks for a fulfilling, well-balanced social life in coherence with surgical pursuit. A career in surgery remains as attractive as it seems after watching Surgeons idolized in media, literature, and popular shows such as “Grey’s Anatomy” world over. Less than 10 % of the medical students aspiring to be surgeons are left-handed while the majority of surgical programs have dedicated right-handed training structures [3]. The data raises some apprehensions for the left-hander. While even the right-handed students are showing a declining interest in choosing surgery, asking themselves a question, “Can I cut it?” [4], left handedness is seen as a further deterrent. Similar apprehensions have existed for left hander in other professions, but left-handers like Benjamin Franklin have proven their mettle, both in science as well as highest public offices.

The future of surgery is changing with simulators, robotics, and the fusion of technology [5]. The paradigm shift in surgical practice happened when the hands of a surgeon were taken away from the body of a patient by laparoscopic surgery [6]. Laparoscopic surgery took the hands and eyes of a surgeon inside the patient’s body without the surgeon needing to touch the patient directly. The direct handling of a patient has been further taken away by the laterality-neutral augmented hand with a 360° wrist, i.e. surgical robot. It makes the laterality, or the handedness, a thing of the past. Social perceptions are slow to change as has been the historical experience. Sir John Ericksen, Queen Victoria’s surgeon in 1937 thought that a surgeon will never be able to manipulate the inside of the abdomen, the chest, and the brain [1]. But today, we do all these manipulations, that too without our hands touching these areas directly. Today, surgeons use both hands with synchronous use of foot pedals while operating on the basis of projected images. This holistic and synergized hand, eye, and foot coordination makes laterality almost irrelevant. The relevance of hand laterality is completely neutralized and abolished by the ability of robot to switch and manipulate active instrument irrespective of the hand in which the instrument is held. The technology available to Generation-Y is, thus, laterality neutral. The exposure of Generation-Y to the social milieu and information age has imparted distinct advantages for a career in surgery. There is sufficient data to support the extrapolation of video-gaming skills into better surgical skills. In fact, there is strong evidence to incorporate serious digital gaming for training of both technical and non-technical skills relevant to the practice of surgery [7]. Moreover, virtual reality and simulation are inherently linked to serious gaming and are also emerging as efficient tools in assessing candidates for surgery training [8]. Surgery is moving the aeronautical way and integration of radiology, endoscopy, and robotics is likely to enable simulation on a preformed, patient-specific

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surgical module [9]. Image-guided hybrid surgery and its integration with “Lapbotic surgery” are the future racing to become Generation-Y’s present very fast [10]. These exciting laterality neutralizing technologies come to me, a left-handed aspiring surgeon, as a blessing given my skills in computers, digital gaming and sports like lawn tennis and table tennis. Using my right hand for all those, even driving a right-handed vehicle comes as an additional asset for a profession that is increasingly relying on “four limb-ness” of a surgeon.

Finally, surgery seems to be moving towards utilization of both left and right hemisphere of the surgical brain. Non-right handedness has been linked to high arithmetic, scientific skills for long [11]. Surgery is a practice-based science. It has been established that in practice-based psychomotor skills for endoscopic manipulation, non-right handedness is not a handicap in anyway [12]. Even for precision, control and fine movement have been shown to be similar with either handedness [13]. Laparoscopic cholecystectomy, the index laparoscopic surgery [14], was shown to be performed equally well in the beginning of the laparoscopic era [15]. Laparoscopic surgery has evolved into even more laterality neutral technologies like Robotics along with integration of the innate skills of Generation-Y. Hence, the innate left-handed, Y-Generational, serious video-gamer, four active limbed animal will drive the future of surgery.

Compliance with Ethical Standards

Conflicts of Interest The author declares that they have no conflict of interest.

References

1. Agarwal BB, Chintamani AK, Goyal K, Mahajan KC (2012) Innovations in endosurgery-journey into the past of the future: to ride the SILS Bandwagon or not? *Indian J Surg* 74:234–241

2. Agarwal BB (2008) Journey of the carbon-literate and climate-conscious endosurgeon having a head, heart, hands, and holistic sense of responsibility. *Surg Endosc* 22:2539–2540
3. Adusumilli PS, Kell C, Chang JH, Tuorto S, Leitman IM (2004) Left-handed surgeons: are they left out? *Curr Surg* 61:587–591
4. Hill EJ, Bowman KA, Stalmeijer RE, Solomon Y, Doman T (2014) Can cut it? Medical students’ perceptions of surgeons and surgical careers. *Am J Surg* 208:860–867
5. Satava RM (2009) How the future of surgery is changing: robotics, telesurgery, surgical simulators and other advanced technologies. *J Chirurgie* 5:311–325
6. Marescaux J, Diana M (2015) Inventing the future of surgery. *World J Surg* 39:615–622
7. Graafland M, Schraagen JM, Schijven MP (2012) Systematic review of serious games for medical education and surgical skills training. *Br J Surg* 99:1322–1330
8. Maan ZN, Maan IN, Darzi AW, Aggarwal R (2012) Systematic review of predictors of surgical performance. *Br J Surg* 99:1610–1621
9. Luketich JD, Alvelo-Rivera M, Buenaventura PO, Christie NA, McCaughan JS, Litle VR, Schauer PR, Close JM, Fernando HC (2003) Minimally invasive esophagectomy: outcomes in 222 patients. *Ann Surg* 238:486–495
10. Redan JA (2014) “Lapbotic” surgery: Blending the expertise of an advanced minimally invasive surgeon with the precision of a robot to best serve the patient. *JSLs* 18:e2014.00373
11. Annett M, Manning M (1990) Arithmetic and laterality. *Neuropsychologia* 28:61–69
12. Hanna GB, Drew T, Clinch P, Shimi S, Dunkley P, Hau C, Cuschieri A (1997) Psychomotor skills for endoscopic manipulations: differing abilities between right and left-handed individuals. *Ann Surg* 225:333
13. Elneel FH, Carter F, Tang B, Cuschieri A (2008) Extent of innate dexterity and ambidexterity across handedness and gender: implications for training in laparoscopic surgery. *Surg Endosc* 22:31–37
14. Agarwal BB, Nanavati JD, Agarwal N, Sharma N, Agarwal KA, Manish K, Saluja S, Agarwal S (2016) Biomolecular inflammatory response to surgical energy usage in laparoscopic surgery: results of a randomized study. *Surg Endosc* 30:1733–1741
15. Pouw L, Tulloh B (1995) Laparoscopic cholecystectomy for the left-handed surgeon. *Br J Surg* 82:138