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LETTER TO EDITOR

Organ harvesting as a mandatory training step of all PGY1 and PGY2 surgical residents

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To the Editor,

Good surgical training is essential for the formation of excellent surgeons, consequently providing the best possible care for our patients in the future. Considering the increase in surgeon shortage over the last two decades (1, 2) (estimated between 14,300 and 23,400 by the year 2032 only in the US) (3), it is important for filling the national health system's needs as well. Finally, respectable surgical training will allow preservation of residency programs by annually attracting more and more new candidates.

Every country has its' own structure of surgical training, and it differs immensely between states, sometimes even within the same country (4).

In recent years, several issues were raised regarding inadequacy of surgical training in some of the most developed countries (5). Resident-directed surveys, done primarily in Italy, Spain and Germany, evaluating urological training in particular, revealed a lot of training-related concerns such as residents' low exposure to major surgeries and a lack of their active participation during them (4-10). Reasons for this trend might be multiple, starting from the administrative work overload, increasing medico-legal assessments and lawsuits, development of the new, high-tech devices that do not allow both mentor and trainee working simultaneously (e.g. single-console robotic systems and novel laser techniques) and neo-specialists still in learning curve. Although we have training centers with simulators dedicated to resolving these issues, concerns such as poor understanding of the skill-retention, possibility of the skill decay and scarce evidence about simulators improving clinical outcomes are often discussed (11, 12).

As if that was not enough, a significant reduction in elective procedures occurred during the COVID-19 pandemic. This has had a huge impact on surgical activity and residents, with 50% reduction in procedures with them as primary surgeons (13-15). Furthermore, the reality of many residents is a lack of time they can dedicate to simulators at their disposal (4).

So, can this be mediated? What are the questions we are frequently asking our residents and ourselves? What are the most important skills a surgeon should possess before stepping in the OR? A good base of the surgical anatomy, familiarity with different organ tissues, textures and resistances as well as proficiency in various methods of suturing and knot-tying.

Although residents have access to a lot of learning material (e.g. recordings of the operations) that might help improving their knowledge about surgical anatomy, it does not provide any practical training nor tactile experience.

In some centers, residents have access to simulators or, in other cases where they do not, tutorials on how to build your own, low-cost training models1 (6, 17) are available. Unfortunately, they often do not reproduce truthfully the real-life tissue consistencies.

Further, programs that offer training on the cadaveric models are also available (18, 20). The major problems with cadaveric models are firstly, the availability of them, secondly, they are expensive, and lastly, but maybe the most importantly, the ceased circulation, low temperature and electrolytic imbalances alter organs. So, in the end, even cadaveric models are not able to faithfully reproduce the real-life medical procedures.

Now, if we do not teach young surgeons today, we will not have any surgeons, or at least not capable surgeons, tomorrow, so these issues need to be addressed as soon as possible.

In addition, Italy is facing yet another challenge considering that, a few years back, EPAteam (national association for liver transplant patients) predicted shortage of transplant surgeons (21) and availability to harvest organs at late night hours.

All in all, we are in a desperate need of better surgical training and in a serious need of (transplant) surgeons. One must wonder, couldn't we simply involve surgical residents in organ harvesting as a mandatory structured program during the first two years of their training? Instead of two transplant surgeons, organs could be harvested (and transplanted for that matter) by one transplant surgeon and one trainee or, even, by two senior supervised trainees. Why should we use cadaveric models if we have access to a living body? Could this be a win-win solution?

Simply, it seems a nearly perfect answer to all of our problems: surgical anatomy can be mastered very well and quite

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quickly, novices could become more acquainted with organ structures, connections and textures as well as learning how to manipulate various organs without creating too much damage. Moreover, during arterial or venous graft harvesting and abdominal wall closure residents could practice various types of knot-tying and improve their knowledge about suture materials, suture size, and the components of the surgical needle.
The major pitfall of this proposal is the fact that not all training-centers have transplant programs. But how many surgical residency programs already include rotations in other departments or hospitals? So, couldn't this principle simply be applied to here-proposed organ-harvesting program? This would provide both, better education for the residents and could help greatly our transplant teams. It would mean night hours, and some training programs do not allow or simply do not encourage them, but this rotation could have only a three to four months duration.
Of course, this is just an idea that needs furnishing, thought, elaborated and structured plan, but surely worthwhile considering, at least for a discussion.

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