

Abdominal wall reconstruction (AWR): the need to identify the hospital units and referral centers entitled to perform it

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Criteria to identify hospital units and referral centers in Italy entitled to perform major general surgery, such as esophageal, hepato-pancreatic and colo-rectal surgery were recently proposed [1]. The role of indicators of effectiveness and quality of care, and dramatic innovations in modern surgical subspecialty concur with this proposal [2]. Furthermore there is a robust evidence of improved outcomes of patients treated by specialist multidisciplinary teams.

Abdominal wall reconstruction (AWR) for primary or incisional hernia remains a challenging problem for primary care physicians, surgeons, and patients. Cochrane collaboration places the number of AWRs performed in Europe at about 400,000/year and at 300,000/year in USA [3]. In USA this number is expected to increase of 11,000 procedures each year in the near future. Taking into account the number of repairs performed in 2006, the total estimated procedural cost for AWR was US \$3.2 billion [4]. We personally calculated that 40,000 AWRs (ICD-9 procedural code 53.51, 53.61, 53.59, 53.69) were performed in Italy in 2014 with an estimated cost of 200 million euro, without taking in account economic costs to society including time lost for work and chronic disability (associated with hernias). Approximately a quarter of all incisional hernia repairs needs a reoperation, even with the use of meshes, and the recurrence exponentially increases with subsequent repairs [5]. This could cause significant further rises in healthcare costs mainly if technologically

advanced meshes or biologic implants are required [6]. In USA each 1% reduction in hernia recurrence would result in a US \$32 million yearly savings in procedural cost alone. Moreover, other complications, such as surgical site occurrence (SSO), mainly the surgical site infection (SSI), length of hospital stay and quality of life should be taken in account. The cost for an outpatient AWR rises from US \$16,000 to 65,000 and 82,000, in cases of SSI and mesh infection, respectively [4, 7, 8].

Over the last 20 years a great number of innovations both in operative techniques and technologies have revolutionized surgical treatment.

New reconstructive procedures, including component separation, gained popularity with the additional potential benefit of restoring functionality of the abdominal wall. Furthermore, laparoscopic ventral hernia repair (LVHR) improves patient-centered outcomes and represents a viable option in selected cases [9]. Mesh repair significantly reduces the number of recurrences but it needs a strong knowledge of the characteristics of devices, more and more largely proposed on the market [10–12]. Careful matching of patient characteristics and surgical techniques in the choice of prosthetics could minimize postoperative complications and readmissions [13]. In conclusion, it seems inevitable that surgeons are specializing in abdominal wall surgery to an increasing extent [5].

Are AWRs “complex” enough to warrant hospital units and referral centers entitled to perform them? Despite the development of prosthetic techniques, results following abdominal hernia repair are not so good as expected, in term of recurrence and wound complications. Numerous factors should be taken in account, including that in several cases of ventral hernia the best technique and the proper device have not been utilized [5]. This principally happens in case of complex abdominal wall hernias, when clear criteria of

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definition, such as the size and location of the defect, contamination and soft tissue conditions, patient history and risk factors, clinical scenario, are mandatory [14]. So it is difficult to argue that AWR is not complex enough to warrant specialization. AWR is clearly not a minor surgery. It is a major surgery requiring long operative times, skilled surgeons with high volume experience in complex cases, a multidisciplinary approach and risk stratification models to reduce complications and mortality rate [15].

Recently, Aquina et al. [16] reported that surgeon's volume experience plays a significant role in outcomes and costs of incisional hernia repair. On the basis of SPARCS (Statewide Planning and Research Cooperative System) database of New York State (18,167 incisional hernia repairs), the study demonstrated that surgeons performing an average of ≥ 36 repairs/year had significantly lower reoperation rates, operative time and downstream charges. Moreover, for every increase in volume of ten cases per year, there was a significant reduction of recurrence rate. The study did not include LVHR or more complex open hernia repairs with component separation or abdominal wall reconstruction, for which a stronger volume–outcome relationship for hernia recurrence is expected.

In 2013, Colavita et al. [17] investigated trends and outcomes from high-volume and low-volume centers for inpatients ventral hernia repair in USA and argued for regionalization and formation of centers of excellence. The establishment of comprehensive hernia centers for hernia repair has led to a substantial increase in surgical volume, complexity and financial benefits [18]. This may reflect the referral of more complex ventral hernia repairs to high volume centers. Sanders et al. [5] suggested the creation of regional and national centers for the UK, competent in cases requiring AWR with component separation, parasitomal hernia repair, complex abdominal wall reconstruction (cAWR), and closure after laparostomy, or neoplasms.

In Italy, we recently proposed to the Italian Society of Hernia and Abdominal Wall Surgery (ISHAWS) to perform a national inquiry to collect the opinion of its members with regards to the accreditation of centers of excellence. A specific Commission will be subsequently set up (1) to define the criteria to identify hospital units entitled to perform AWR in Italy, on the basis of hospital, volume and organization requirements, and (2) to define an accreditation program, periodic audits included. The results of this work should be presented to the Italian Society of Surgery (SIC) and then sent to the Ministry of Health before being released.

Compliance with ethical standards

Conflict of interest The Authors declare that they have no conflict of interest.

Research involving human participants and/or animals This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent None.

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