

# Current Status of Hernia Centres Around the Globe

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**Abstract** Institutions specifically dedicated to treatment of abdominal wall hernias have gained popularity over the last years. This study aimed to determine the current situation of hernia centres worldwide. A web-based search was conducted using the common search engines Google and PubMed. The details recorded were as follows: name of the centre, country, establishment year, administrative structure (hospital affiliated, private practice group, or independent solo practice), whether or not the centre has its own operation room, the number of employed surgeons, preferred anaesthesia type, preferred repair type, laparoscopic technique option, case volume per year, and the number of scientific publications. A total of 182 centres were found in 30 different countries. Eighty-one (44.5 %) centres provide services as part of an affiliation within a general hospital (18 in university hospitals). Only 28 (15.5 %) of the centres have published a paper on abdominal wall hernias indexed by PubMed. The total number of papers in PubMed by 182 centres is 354. We observed that clinical outcomes in hernia centres are not shared globally by publishing them in scientific journals, and whether specific hernia surgeons and centres provide better outcomes in treating abdominal wall hernias, compared to general surgeons who deal with all kinds of surgical procedures, remains unclear.

**Keywords** Hernia · Hernia repair · Hernia centre · Publication

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## Introduction

Institutions specifically dedicated to treatment of abdominal wall hernias have gained popularity over the past few decades. The story began with Shouldice Clinic in 1945 [1], which later became Shouldice Hospital, and continued as Lichtenstein Hernia Institute [2]. After reporting successful results with very low recurrence rates from these specific centres, many patients have come to prefer this kind of facility. As a result, new centres have been established over time.

Today, a number of institutions provide services under the name ‘hernia centre’, although titles like ‘hernia institute’, ‘hernia unit’, or ‘hernia clinic’ are also in use. The characteristics of these centres vary greatly. Some are private clinics with or without their own operating room, while others are affiliated units in the university or other hospitals in the area.

To date, no exact definition of a specific hernia centre has been given. Neither a specific governmental regulation in any country nor a recommendation by hernia societies or surgical associations exists. This study aimed to determine the current situation of hernia centres across the world and to build a platform for considering such a definition.

## Methods

A web-based search was conducted using the common search engine Google in March 2013. Several keywords, including ‘hernia centre’, ‘hernia clinic’, ‘hernia institute’, and ‘hernia unit’, were searched in different languages available in Google Translate. All web pages identified by the search engine were investigated carefully. When a target centre was found, its website was examined in detail and data recorded. The first recorded was whether the centre’s website was its own or was it located within the website of another institution, i.e. a hospital. The details recorded were as follows: name of the

centre, country, administrative structure (hospital affiliated, private practice group, or independent solo practice), whether or not the centre has its own operation room, the number of employed surgeons, preferred anaesthesia type, preferred repair type, laparoscopic technique option, and case volume per year. PubMed was also searched to determine if each centre encountered had any published papers as well as the number of publications and the number of publications with its hernia surgery-specific name in the 'Affiliation' field of the PubMed search engine. When a publication was found to be authored by a surgeon(s) employed by a centre, it was considered a publication of that centre, unless there was no affiliation at all.

Statistical analyses were performed using SPSS version 11.5. Mean  $\pm$  standard deviation (SD) and frequency (percent) for categorical variables were given as descriptive statistics. To compare groups in terms of categorical variables, the chi-square test was used; to compare groups in terms of metric variables, Mann–Whitney and Kruskal–Wallis variance analyses were performed. A *p* value  $<0.05$  was considered to be statistically significant.

## Results

A total of 182 centres were found in 30 different countries (Fig. 1). Overall, 75 centres are located in North America (41.2 %), 78 in Europe (42.9 %), and 29 (15.9 %) in other parts of the world.

Exactly one half of the centres have a self-owned website, while the remaining one half maintains a webpage within the website of another facility, most often a hospital, as a link. Seventy-eight (43 %) of the institutions employ a single

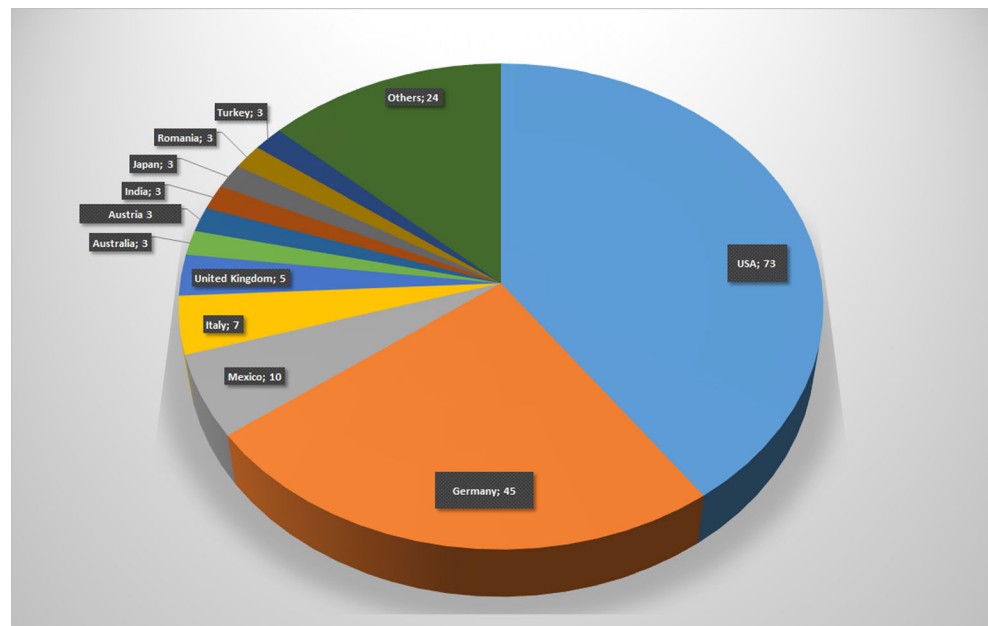
surgeon, 33 (18 %) employ two surgeons, 23 (13 %) employ three surgeons, and 48 institutions (26 %) employ 4 or more surgeons. Seven centres in the USA employ plastic surgeons for the repair of complex abdominal wall hernias. None of the centres employ paediatric surgeons and do not provide service for paediatric hernias. Almost all of the surgeons employed by hospital-affiliated hernia centres are dealing with some or all fields of general surgery. Dedicated hernia surgeons and hernia centres are relatively few. Only 40 of 182 centres (22 %) deal with hernia surgery alone. Some surgical procedures, such as vein surgery and proctology, are performed in some private hernia centres.

Eighty-one (44.5 %) centres provide services as a part of a general hospital (including 18 in the university hospitals). Sixty-two centres are a part of a practice group each that serves different branches of surgery or medicine. The majority of hernia centres (131; 71.8 %) use an operating room in a hospital, while 32 centres (17.5 %) operate in a multipurpose surgical/medical centre. Only 18 centres have their own operating room facility (10 %).

Only 20 centres mention their case volume per year varying from 200 to 1,700 patients with hernia. Laparoscopic repair is offered in 152 centres (84 %). The information on preferred type of anaesthesia is not provided by the websites of 141 centres (77.5 %). Those with listing of the type local, general, and regional anaesthesia are the preferred choices in 25, 12, and 2 centres, respectively.

The PubMed search for the frequencies of the biomedical publications from the hernia centres has revealed that only 28 (15.5 %) of the centres have published a paper about abdominal wall hernias. The total number of papers in PubMed by 182 hernia centres is 354. Papers from the most productive 3

**Fig. 1** Distribution of 182 hernia centres worldwide by country



centres in this ranking made up one half of the total number (179/354). Hernia centres have published 102 papers with their specific names such as Lichtenstein Hernia Institute or Carolinas Hernia Centre (Table 1).

No difference was observed between the centres affiliated with a hospital and centres in private practice with regard to publishing at least one article indexed in PubMed (18.8 vs. 12.9 %, respectively;  $p=0.277$ ). In another view, no significant differences were found between these two types of centres in mean and median number of total publications and publications with the centre's own name, although hospital-affiliated centres displayed higher mean values (Table 2). A positive weak correlation was found between the number of the surgeons employed by the centre and the parameters of publication.

North American hernia centres seem to publish more frequently in comparison with Europe and other parts of the world combined (24.0, 9.0, and 13.8 %, respectively;  $p=0.028$ ). The mean number of publications was 3.36 for North America, 1.08 for Europe, and 0.66 for the others ( $p=0.017$ ). Interestingly, the median value for these three groups was virtually 0.

## Discussion

Today, herniology can be considered as an unofficial subspecialty of general surgery, dealing with the treatment of abdominal wall hernias. This term was first used in a Russian article

**Table 1** The hernia centres most frequently published in the biomedical journals

Centre	Country	Number of publications	Publications with centre's name
Lichtenstein Hernia Institute	USA	72	33
Carolinas Hernia Center	USA	60	7
Cleveland University Case Comprehensive Hernia Center	USA	47	15
Plymouth Hernia Service	UK	32	6
Clinica Hemia Murcia	Spain	29	0
Maryland University Hernia Center	USA	12	0
Shouldice Hospital	Canada	11	11
British Hernia Centre	UK	11	11
New Jersey Hernia Center	USA	11	11
Indian Hernia Institute	India	8	0
Hernia Institute Florida	USA	7	7
Hernia Institute University Southern California	USA	6	1
Ankara Hernia Center	Turkey	6	6
Munich Hernia Center	Germany	5	4

**Table 2** Publication activity of affiliated and private hernia centres

	Number of publications	Publications with hernia centre's name
Affiliated		
Mean	3.40 ( $\pm 12.41$ )	0.61 ( $\pm 2.51$ )
Maximum	72	15
Private		
Mean	0.72 ( $\pm 2.29$ )	0.58 ( $\pm 2.13$ )
Maximum	11	11
Overall		
Mean	1.95 ( $\pm 8.51$ )	0.59 ( $\pm 2.29$ )
Maximum	72	15

Figures in parenthesis are standard deviations  
 $p=0.284$

in 1965 [3]. The first paper in English to use 'herniology' in its title was published in 1984 [4]. Read, a senior herniologist, has frequently used 'herniology' as a title word in his publications [5, 6]. Today, evidence shows better surgical outcomes occur with specific hernia surgeons and centres, with no formal certifications programmes yet [7–12].

The number of hernia-specific centres around the globe has been increasing [13]. The term 'Independent Hernia Centre' also remains undefined. Even if we are unsure a definition is necessary. Does an independent centre have its own building, or even its own operating theatre, or should it deal exclusively with abdominal wall hernias with or without its own separate physical facilities? In the USA, 70 % of the Medicare-certified ambulatory surgical centres are independent [14]. The pioneers of hernia-specific surgery could be considered as independent centres as well. Most hernia centres serve as an office, and surgery is performed in a close hospital. This is predictable because, today, many surgeons from private surgical practices—including those that deal with hernia surgery—contract with one or several hospitals. Nearly one half of the hernia centres or units around the world are affiliated already with general hospitals. This may be a projection of the fact that hospitals have been trying to build targeted specialty services to increase market share and revenue [15]. General hospitals provide services in almost all specialties of surgery, and it is not hard to establish a hernia centre within its confines. It is not clear if the hernia centres in a general hospital really employ specific hernia surgeons. The presence of a hernia surgeon in a general hospital will not be tantamount to calling the facility as a hernia centre without specific schedules or physical facility or part of a facility.

In our opinion, a specific hernia centre should have the targets of education, dissemination of knowledge, and scientific publications for its colleagues. In the era we live, the number of publications about abdominal wall hernias has

increased obviously. The growth in hernia-related publications is greater than the overall growth of biomedical publications in PubMed [16]. Nevertheless, we found that 154 of 182 centres claiming to be specific hernia centres have not published any papers. Working in a hernia centre surely does not render one as an opinion leader in herniology; however, claiming to be a hernia specialist in a specific hernia centre may necessitate reporting the clinical results, sharing experience and technical details, and presenting valuable recommendations for other general surgeons. Specific centres have a great opportunity to collect a large volume of cases, record data in detail, and follow patients more closely; therefore, any good scientific report from these centres can enlighten the methods of other surgeons. No doubt, no formal definition for a hernia centre exists regarding scientific publications, and a specific centre may provide services for patient benefit only. We do think, however, that a negative picture of publication activity in the present survey has brought into focus an important issue—professional and educational responsibility and dissemination of centres' experience.

In conclusion, although the number of specific hernia centres has increased, the rate of surgeons who deal only with hernia surgery is still very low. In the era of subspecialties in general surgery, we think that better hernia care will be provided by increasing the number of specific surgeons and centres. This may also result in better use of resources of health economics by reducing the recurrence and the rates of surgical site infections. Official websites are understandably designed for patients and their relatives and do not contain academic information except for certain centres like the British Hernia Centre. Enriching the websites with academic information and articles would also be more useful for the surgeons worldwide. The rate of scientific publication is rather low, except for well-known, long-standing institutions and centres located in academic settings. Specific centres should share their experiences and clinical outcomes more often by publishing their practice and the results. This is likely to enhance the dissemination of quality information for the surgeons in general and patients in particular.

**Conflict of Interest** Hakan Kulacoglu and Derya Oztuna declare no conflict of interest.

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