

Infonomics and Breast Reconstruction

Are Patients Using the Internet?

Albert Losken, MD, Renee Burke, MD, L. Franklyn Elliott II, MD, and Grant W. Carlson, MD

Abstract: The World Wide Web provides access to an enormous amount of medical information. In particular, it enables the non-medical community a chance to better understand breast reconstruction. The purpose of this survey is to determine patient access to the Internet for information related to their breast reconstruction and to evaluate the role of internet-based information in patient education.

One hundred six consecutive breast reconstruction patients over a 7-month period were included in the study. All patients were given an anonymous survey querying patient demographics, education, type of reconstruction, internet usage, and how it affected their decision. Data were evaluated and comparisons were made.

The average age was 50 years, with the majority of the reconstructions being pedicled TRAM flaps (50%). Ninety-two percent of the patients had internet access, most of them at home (71%). Sixty-eight percent of the patients reported having used the internet for information related to breast reconstruction. The categories searched were procedure (39%), risks/outcome (35%), surgeon (13%), pictures (11%), and hospital (4%). Seventy-two percent found it helpful, 69% easy to understand, and 63% trusted the information. The information they found influenced their decision regarding procedure (53% yes), surgeon (36% yes), and hospital (25% yes). Eighty-one percent felt that it would be useful to communicate with their surgeon via e-mail.

Breast-reconstruction patients are using the internet as a research tool. They are influenced by this information on multiple levels. Infonomics is a growing field, and plastic surgeons must take an active role in guiding patients towards accurate online sources and becoming more accessible in the information superhighway.

Key Words: breast reconstruction, internet, infonomics, patient education

(*Ann Plast Surg* 2005;54: 247–250)

Received and accepted for publication August 20, 2004.

From the Division of Plastic and Reconstructive Surgery, Emory University School of Medicine, Atlanta, GA.

This paper was presented at the Annual Meeting of the Southeastern Society of Plastic and Reconstructive Surgeons, Hot Springs, VA, 2004.

Reprints: Albert Losken, MD, Emory Division of Plastic Surgery, 550 Peachtree Street, Ste 84300, Atlanta, GA 30308. E-mail: Albert_Losken@emoryhealthcare.org.

Copyright © 2005 by Lippincott Williams & Wilkins

ISSN: 0148-7043/05/5403-0247

DOI: 10.1097/01.sap.0000153159.53918.d4

The public now has endless access to medical information on the internet. Health sites are among the most popular searches on the Web, with more than 60 million people using the internet for medical information in the United States alone.^{1,2} The internet has become an increasingly popular research tool. It is convenient, accessible, and enables the nonmedical community access to an enormous amount of medical information. It has been demonstrated that patients use the internet to seek help, make treatment decisions, research information, and make social connections.³ Breast cancer patients are among the highest personal users of the internet,⁴ likely due to the large number of breast cancer information sites and support groups available.⁵ It has subsequently become apparent that our breast reconstruction patients are well informed on information from surgeon education and hobbies to perforator flaps and their incidence of fat necrosis. The internet is a very popular tool for searching information about breast reconstruction. Despite the potential impact that these new technologies have on the roles and relationships of patients and doctors, little research has been done on how breast-reconstruction patients use information from the internet.

Infonomics studies the science of human-centered information systems. It attempts to understand all the fundamental human information technologies and the unique value that we receive from them. The purpose of this study is to evaluate patient access to the internet for information related to their breast reconstruction, its use as an educational tool, and how it affects them.

METHODS

All patients who underwent breast reconstruction between August 2003 and April 2004 at the Emory Affiliated Hospitals and Northside Hospital were included in the series. They were asked to fill out an anonymous questionnaire on their first postoperative visit. Data points queried included patient demographics, type of reconstruction, level of education, use of the internet (where and how often), use of the internet for health and breast reconstruction-related information, and search engines. We also queried what they were looking for, how they felt about the information, and how it

affected their reconstructive decisions. Numerous comparisons were made.

RESULTS

Demographics

One hundred six consecutive breast-reconstruction patients were included in the series, with an average age of 50 years (range: 30–70). The type of reconstructions included pedicled TRAM flap 50% ($n = 53$), implant reconstruction 19% ($n = 20$), latissimus doris + implant 17% ($n = 20$), free TRAM flaps 13% ($n = 14$), and other 1% ($n = 1$). Ninety-one percent of patients had a computer at home ($n = 96$), with only 3% of those not having internet access at home.

Internet Usage

Overall, 92% of the patients ($n = 97/106$) had internet access, used most often at home 71%, work 27%, school 3% and library 1%. Internet use increased with level of education (Table 1). Only 20% never used the internet for health-related information, 32% used it once every few months, 25% used it 1 to 3 times a month, 9% once a week, 9% used it 2 to 5 times a week, and 9% over 5 times a week.

Information Related to Breast Reconstruction

Sixty-eight percent ($n = 72/106$) reported using the internet for information related to breast reconstruction. The most common categories searched ($n = 181$) were procedure 39% ($n = 55$), risks and outcome 35% ($n = 51$), pictures 13% ($n = 29$), surgeon 11% ($n = 27$), and hospital 4% ($n = 20$). Table 2 lists the particular search engines used (Table 2). The patient satisfaction level with the information found on the internet is demonstrated in Table 3.

Impact of the Internet Information

The information found on the internet influenced their decision regarding procedure 53% ($n = 38/72$ Yes), surgeon 36% ($n = 26/72$ Yes), and hospital 25% ($n = 18/72$ Yes). Eighty-one percent ($n = 58/72$) would be interested in communicating with their surgeon via e-mail.

TABLE 1. Internet Use as a Function of Education

Education	No.	Internet Use, No. (%)
High school	14	11 (79)
Some college	29	26 (89)
College	42	39 (93)
Graduate	21	20 (95)
Total	97	

TABLE 2. Search Engines Used for Breast Reconstruction Information ($n = 118$)

Search Engine	Percentage
Yahoo	33
American Cancer Society	19
America Online	19
Google	9
NIH	8
Medline	4
Other	8

NIH, National Institutes of Health.

TABLE 3. Patient Satisfaction With Internet Information ($n = 72$)

	Agree	Somewhat Agree	Disagree
Was the information helpful?	52 (72%)	18 (25%)	2 (3%)
Was the information easy to understand?	50 (69%)	20 (28%)	2 (3%)
Did you trust the information?	45 (62%)	27 (38%)	0 (0%)

DISCUSSION

The information revolution reached a zenith in the last decade of the 20th century. The combination of computer and telecommunication (teledigital) technology has influenced every aspect of human culture and life. Society has adapted to technological advances by using the Web for access to medical information. Patients use the internet for its convenience, ease of use, 24-hour availability, and privacy.⁴ Breast-cancer patients are known for their utilization of the internet for information and support. There are many breast-cancer resources, medical journals, and clinical trial registries available through the appropriate indexes such as Cancerlit, MedlinePlus and Cancerlinks.⁵ It is subsequently not surprising that over two thirds of our patients reported using the internet for information related to breast reconstruction. This is testimony to the fact that the internet is felt by many to be a desirable and very powerful research tool.

The ability to access specialized information on the internet affects the patient on multiple levels. It has changed the patients' coping mechanisms, as well as the relationships between patients and doctors. It allows the patient to ask educated, informed questions, be more prepared and subsequently better understand the options suggested to them by their surgeon, and display competence and familiarity with their condition with society. It also allows the patient to make more informed decisions with a greater degree of participation in their treatment plan.

To better guide our patients, we need to understand the flow of breast-reconstruction information on the internet and familiarize ourselves with the different internet “surfing” habits. We need to know more about the specific needs of our patients and try to understand what they really wanted to know about breast reconstruction. Analyzing queries from search engines would be one way of determining what content to provide the users of a given website.⁶ Many users will start on the popular search engines, such as Yahoo and America Online, rather than the specialized health information sites. Although this might be more accessible, is it as effective and accurate? Berland et al⁷ evaluated the accessibility, quality, and reading grade of health information on the internet (breast cancer, obesity, depression, and asthma). They found that search engines were only moderately efficient at locating information on a particular health topic. Less than one quarter of the search engines’ first pages of links led to relevant content. Although coverage of the key information was poor and inconsistent, accuracy was good. Gordon et al⁸ evaluated the internet as a source of information on breast augmentation and found that information was limited but generally accurate. Most sites were physician websites with photodocumentation of only good results, few adequately discussed complications, 83% were biased towards a particular procedure, and only 15% of the sites were found to be acceptable to recommend to patients. Although health information rating systems to specifically evaluate internet sites exist, search engines do not use them to sort Web pages, once again placing concern on the utility of these evaluation tools.^{9,10}

The internet can be useful as a source of information and support. Women in our series were interested in finding breast-reconstruction information regarding procedure, risks, and outcomes and were definitely influenced by the information they found. This raises an important concern, which has been the focus of many recent articles, namely, the quality of health information on the internet.¹¹ Several studies have evaluated single medical conditions on the internet and have suggested deficiencies in the quality of this internet based health information for many medical and surgical specialties.^{12–15} In particular, Jejurikar et al¹⁶ evaluated breast-augmentation information and found that many sites were inaccessible, irrelevant, or contained no medical information. In addition to that, 34% of the sites contained false or misleading information. To date, there has been no study looking at the quality of breast-reconstruction information on the internet. A simple Google search for “breast reconstruction” displays 273,000 sites compared with 481,000 for “breast augmentation.” Although the number of sites and organizations offering information related to breast reconstruction are probably less diverse, the potential for false or misleading information clearly exists. Many websites are likely individual or physician group websites. These are often

intended to be more of an advertising tool for the surgeon rather than a pure, nonbiased educational tool for the patient. Although the information might be accurate, biased or incomplete information can be misleading. Such misinformation could negatively influence the public’s perception of reconstructive options and possibly deter your patient from an otherwise reasonable treatment course. This was not evaluated in our series; however, a few patients reported using hospital, commercial, and nonprofit sites as their source. The majority of our patients found the information useful, easy to understand, and trusted what they read; however, there is significant room for improvement.

We have demonstrated that patients are routinely using the internet as a research tool and source of information for breast reconstruction, and more importantly that their decisions are being affected by this information. Although the World Wide Web has been an invaluable addition to society in many ways, concerns will always be present, given the nature of the internet and that the information is diverse and not completely controlled. We need to realize that our patients will continue to use the internet and that the information on the internet is variable. To that end, we subsequently need to be more proactive in guiding our patients towards accurate online sources that contain safe, reliable, and non-biased information. Some recommended resources include the National Cancer Institute (cancer.net.ncl.nih.gov), the American Society of Plastic Surgeons (www.plasticsurgery.org), and the American Cancer Society (www.cancer.org). Perhaps some of the more commonly used resource books/pamphlets will eventually be available for patients on the internet. Although the internet will never replace the physician patient dialog and relationship, when used appropriately, it can be a very useful and powerful adjunct tool for both the patient and the plastic surgeon.

REFERENCES

1. Fox S, Rainie L. *The Online Healthcare Revolution: How the Web Helps Americans Take Better Care of Themselves*. Washington, DC: Pew Charitable Trusts; 2000.
2. Eaton L. Europeans and Americans turn to internet for health information. *BMJ*. 2002;325:898.
3. Reeves P. How individuals coping with HIV/AIDS use the internet. *Health Educ Res*. 2001;16:709–719.
4. Ziebland S, Chapple A, Dumelow C, et al. How the internet affects patients’ experience of cancer: a qualitative study. *BMJ*. 2004;328:564.
5. Santoro E. Internet and information on breast cancer: an overview. *Breast*. 2003;12:424–431.
6. Bader JL, Theofanos MF. Searching for cancer information on the internet: analyzing natural language search queries. *J Med Internet Res*. 2003;5:e31.
7. Berland GK, Elliott MN, Morales LS, et al. Health information on the internet: accessibility, quality and readability in English and Spanish. *JAMA*. 2001;285:2612–2621.
8. Gordon JB, Barot LR, Fahey AL, et al. The internet as a source of information on breast augmentation. *Plast Reconstr Surg*. 2001;107:171–176.
9. Biermann JS, Golladay GJ, Greenfield ML, et al. Evaluation of cancer information on the internet. *Cancer*. 1999;86:381–390.

10. Jadad AR, Gagliardi A. Rating health information on the internet: navigating to knowledge or to Babel? *JAMA*. 1998;279:611–614.
11. Eysenbach P, Powell J, Kuss O, et al. Empiric studies assessing the quality of health information for consumers on the World Wide Web: a systemic review. *JAMA*. 1998;280:1371–1375.
12. Soot LC, Moneta GL, Edwards JM. Vascular surgery and the internet: a poor source of patient-oriented information. *Vasc Surg*. 1999;30:84–89.
13. Davison K. The quality of dietary information on the World Wide Web. *Clin Perform Qual Health Care*. 1997;5:64–66.
14. Jiang YL. Quality evaluation of orthodontic information on the World Wide Web. *Am J Orthod Dentofacial Orthop*. 1999;118:4–9.
15. Beredjiklian PK, Bozentka DJ, Steinberg DR, et al. Evaluating the source and content of orthopedic information on the internet: the case of carpal tunnel syndrome. *J Bone Joint Surg Am*. 2000;82:1540–1543.
16. Jejurikar SS, Rovak JM, Kuzon WM, et al. Evaluation of plastic surgery information on the internet. *Ann Plast Surg*. 2002;49:460–465.