

Orthochina.org

Case-based Orthopaedic Wiki Project in China

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Abstract Traditional continuing medical education (CME) depended primarily on periodic courses and conferences. The cost-effectiveness of these courses has not been established, and often the content is not tailored to best meet the needs of the students. Internet training has the potential to accomplish these goals. Over the last 10 years, we have developed a Web site entitled “Orthochina.org,” based upon the wiki concept, which uses an interactive, case-based format. We describe the development of online case discussions, and various technical and administrative requirements. As of December 31, 2007, there were 33,984

registered users, 9,759 of which passed the confirmation procedures. In 2007, an average of 211 registrants visited daily. The average number of first page clicks was 4,248 per day, and the average number of posts was 70 per day. All cases submitted for discussion include the patient’s complaint, physical examination findings, and relevant images based on specific criteria for case discussion. The case discussions develop well professionally. No spam posting or unauthorized personal advertisement is permitted. In conclusion, online academic discussions proceed well when the orthopaedic surgeons who participate have established their identities.

Each author certifies that he or she has no commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc) that might pose a conflict of interest in connection with the submitted article.

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Introduction

Internet use has increased greatly in China. In 2007, 73,000,000 new users came online, with the rate increasing annually at 53.3%. By the end of December 2007, there were 210 million Internet users. The daily increase of new users is 200,000, and there are 140 new users each minute. Of all users, 163 million (77.6%) access the Internet with a broadband network connection (accessing speed over 1 mb per second) [5]. In 2007, there were more than 52 million Internet users living in rural areas, and the annual growth rate for this group was 128%. The urban annual growth rate of Internet users is 38.2% [5]. China’s 2007 information network infrastructure was as follows: 99.5% of administrative rural villages (the lowest level administrative unit [33]) have national telephone network connections, 97% of administrative townships [33] were equipped for Internet access (92% access via broadband) [1]. While the absolute numbers of physicians using the Internet has yet to be quantified to our knowledge, most doctors have access to a broadband connection, even in remote areas.

The Internet can be used for four different purposes: (1) rapid reference; (2) a large volume library; (3) asynchronous communication; and (4) synchronous communication. The Web is a valuable reference tool for accessing medical journals, because the volume and indexing required cannot be matched in hard copy libraries. Asynchronous communication includes bulletin boards, forum, wiki, and other similar formats, and can be used for any purpose, including interactive online orthopaedic training.

Articles specifically focusing on orthopaedic surgery and the Internet first appeared in 1998 [11, 34, 39]. These articles and many publications since introduced the Internet as a valid source of orthopaedic information and provided guidance on where to find information [2, 3, 8, 16, 18, 19, 20, 22, 24].

While examining educational use of the Internet by orthopaedic trainees and consultants, Sinkov et al. [35] found both groups preferred online textbooks. The trainees themselves usually have initiated online posting of notes/reviews on orthopaedic subjects [31, 36, 41] although these efforts were continued after the completion of training in most cases. The Southern Orthopaedic Association's project to produce an online peer-reviewed textbook [26] authored by experts has only delivered a few chapters, but they are of high quality. Ongoing CME is provided online by the American Academy of Orthopaedic Surgeon's Orthopaedic Knowledge Online [12], Howmedica's Orthopedics Hyperguide [29], the Ortho Supersite [25], eMedicine [27], and Medscape [28], among others. Sites for subspecialty information include the Electronic Textbook of Hand Surgery [9], the East Lancashire Foot and Ankle Hyperbook [8], and eRadius on studying distal radius fractures [21]. The Association of Bone and Joint Surgeons has recently launched a collaborative social networking concept (wiki), Orthopaedia, intended as a resource for trainees and others.

Casebeer [4] reported the importance of the Internet to physicians, with regard to both professional development and access to information which leads to better patient care. A specific patient problem is the most common reason for seeking information. We believe that surgeon-to-surgeon communication is the most important, the easiest, most closely related to clinical practice, and cost-effective method of patient-problem-oriented CME. A number of evaluation studies have examined the effectiveness of Web-based CME [6, 10, 15, 32, 40]. One web-based CME instructional format comprising multimedia-enhanced learning tutorials supplemented by asynchronous computer-mediated conferencing for case-based discussions was reportedly effective in enhancing knowledge, confidence, and self-reported practice change outcomes across a variety of clinical subject matter areas [6]. Appropriately designed, evidence-based online CME can produce objectively

measured changes in behavior as well as sustained gains in knowledge that are comparable or superior to those realized from effective live activities [10]. Pinto et al. [32] performed a PubMed search focused on e-learning tools and applications in the health sector, with specific reference to radiology, and concluded that increasing the volume of continuous education will reduce the costs of e-learning and make this training method, which helps keep pace with technological progress, more attractive, with substantial professional gains for radiologists. Karlinsky et al. [15] reported use of effective videoconferencing and online learning activities increases access to quality CME related to workplace injury management. This format overcomes access barriers intrinsic to types of CME interventions based on instructor-student face-to-face interactions. An interactive online CME platform can support active learning and may establish an additional stimulus for knowledge translation into daily medical practice [40].

The first author (MZS) who started the OrthoChina Web site (<http://www.orthochina.org>) in 1998, was a board member of the Internet Society of Orthopedic Surgery and Trauma (ISOST) [14] in 1999–2001, and one of the monitors of the ISOST Orthoped Mailing List [14, 23], and a member of the Orthoped Mailing List [30]. Due to the limitations of the mailing list, the sender cannot transmit large patient-related images to all subscribers, yet good quality images are very important in orthopaedic care. To address the language barrier for orthopaedists in China, we started a bulletin board forum for online case discussions on OrthoChina in November of 1999 [16, 18, 19, 20]. In August, 2005, we refined the Web site with a user-friendly interface and established a management system for sharing cases, electronic orthopaedic textbooks, papers on clinical and basic scientific research, Microsoft PowerPoint (Redmond, WA) slides, and patient-problem-oriented case discussions with multimedia support based upon the needs of orthopaedic surgeons practicing in China [43]. In 2001, we reported our early experience in starting the OrthoChina web site [18, 20] and some online interactive case discussions in Chinese journals [16, 19]. Our work on refining the organization and management of OrthoChina was published in English in 2007 [43], however this report lacked information on China's background and MECIAC. The current paper expands upon the first, in addition to reporting OrthoChina's development and an updated Internet background of China.

OrthoChina serves the orthopaedist in the spirit of openness, fairness, equality, freedom of academic discussion, mutual assistance, and mutual improvement and learning. We encourage the principle of working hard, sharing information, and learning. In these discussions, we focus on the "three basics" of theory, knowledge, and skills/techniques to improve proficiency in diagnosis and treatment.

Surgical Practitioners in China

Medical licenses in China are classified as follows: (1) Clinical (internal medicine or surgery); (2) Traditional Chinese Medicine; (3) Oral Medicine; and (4) Public Health. While surgical procedures may only be performed by individuals qualifying for a diploma of surgery, there is currently no system for subspecialty certification in orthopaedics, general surgery, neurosurgery, etc.; as such, each surgeon has the legal right to perform any procedures from these disciplines. In economically developed regions of the country, especially in urban areas, there are many surgeons who focus exclusively on orthopaedics. In contrast, there are few orthopaedic surgeons in the rural and more impoverished regions of the country. There is a need for exchange of information between orthopaedic surgeons, as well as between orthopaedic surgeons and other surgeons or caregivers responsible for caring for patients with musculoskeletal problems. One means of ongoing medical education by which practitioners can gather additional opinions on how to manage specific cases (as well as to learn from other's cases) is through an online, case-based interactive forum.

Continuing Medical Education

Continuing medical education (CME) is meant to bridge the gap between new scientific observations and clinical practice. By definition CME provides new knowledge, but how does one apply that knowledge in practice and avoid errors in applying the new knowledge? CME has traditionally used a format of courses and conferences which are didactic rather than interactive. Their content is not always created to best meet the needs of the learners. The pace and location cannot be controlled by the learner, and the material is not provided at the location where the clinician needs the information.

On the other hand, an interactive online case discussion can provide an easy format, closely-related to the learners' clinical practice, and is a cost-effective way to allow doctors to conveniently follow case discussions anywhere, anytime. The participants can be teachers and/or learners at the same time. However, there have been few quality control systems for interactive online CME.

Management of the OrthoChina Web site

OrthoChina is a nonprofit orthopaedic web site only for orthopaedic surgeons. All aspects of OrthoChina are in accordance with Chinese law.

The Webmaster and Chief Editor of the OrthoChina site is a senior orthopaedic surgeon (MZS) with considerable experience in orthopaedics. The software and hardware engineering is supported by professional engineers from the Software Engineering College of Xi'an Jiaotong University, Xi'an, and the Data Bureau of China Telecommunication Group (Weinan City, Shaanxi Province). With this technical support, the Web site maintains a stable, well-controlled software environment. The moderators in each forum are qualified orthopaedic surgeons who have expertise in the appropriate subspecialty areas. The moderators are well-trained in the software management system, the regulations and requirements in using the site, and the standardized procedures in managing the quality of the cases (and comments) which are submitted. An open voting program is used to select the moderators, who supervise one another to ensure quality and fairness. Moderators must be enthusiastic orthopaedic surgeons willing to dedicate sufficient time to the endeavor. Each moderator is a registered user who actively takes part in case discussions, web site management, and construction with no limit on age, area, gender, and employer, etc. Each forum has two to five moderators. Based on their experience in orthopaedics and management skills, they are divided into academic moderators and administrative moderators. The academic moderators (senior surgeons) are responsible for case discussions by giving suggestions for diagnosis and treatment for the posted cases, and guiding the direction of the discussion. The administrative moderators (junior orthopaedic surgeons but experienced in managing the forums) are responsible for managing (editing, deleting, and tidying up the forum) the quality of materials posted (images, information).

The moderator election program has standard rules and procedures as follows: application, voting/selection, training, internship, on duty. After applying to be a moderator, the candidate must prove his or her qualification in orthopaedics and management of the forum. After getting 20 votes in the following 7 days, the candidate is elected and trained in managing a forum, and goes to the internship stage for 7 days; after 7 days of internship, the candidate must obtain another 20 votes to be the moderator. The applicant must seek and obtain permission and agreement from the present moderators if there are moderators in the same forum. The competitive idea is included in the election program. If the users are not satisfied with the moderators' work, the moderator may be removed from the managing team by a voting procedure.

To guard against copyright infringement and maintain safety of the operating system, the author selected free open-source applications for the operation of OrthoChina: Redhat Linux AS2 (operating system; Redhat Inc., Beijing, China, <http://www.redhat.com.cn>) and MySQL (database; of

MySQL AB, Cupertino, CA, <http://www.mysql.com>) in conjunction with Tomcat-connector, Apache and Tomcat (Apache Software Foundation, Forest Hill, MD, <http://www.apache.org>).

The Web site is designed and structured using the wiki concept (i.e., Wikipedia [42]). Web content is created collaboratively by users through an Internet browser. Users without programming skills can create Web applications, and manage the site easily by using just a browser. Information may be posted, edited, deleted, and updated by anyone with permission to do so, at any time. The moderator can post content in any column, but can only edit, delete, and update the content in the specific column he moderates. The other users can only post content in forums (columns open for discussion), and can only edit and update the content posted personally, but he cannot delete the content once posted. All content is open to viewing, and is academically monitored by the general orthopaedic users. All editing, deleting, updating, credit score increasing and decreasing steps are tracked in detail, such as time, IP address, user, etc. The administrators, moderators, and orthopaedist users monitor one another.

All static information (content published just for viewing, not for discussion) are reviewed, selected, and edited by the administrative staff members for academic purposes. The dynamic information posted in forums is monitored by administrators and moderators academically.

Confirmation of Orthopaedists on OrthoChina

We use four procedures to confirm orthopaedist identity. The first is a Question and Answer test. OrthoChina has 2500 single and multiple choice questions and answers test database (the Q&A database is updated every day by orthopaedic users by inputting new tests). If the user wants to register and get the identity of the Orthopod (the name used in OrthoChina for orthopaedist), the user must complete 10 questions and answers including single and multiple choice that are randomly and automatically abstracted from the database. Seven of the 10 questions must be correctly answered. The second is to present the register's license ID to show that the register is a licensed orthopaedic surgeon, the third is a colleague's recommendation, and the fourth is an employer's recommendation (in which case the user does not have to take the Q&A test).

To stimulate registered users to actively participate in discussions, to improve the quality of the posts (cases, replies to comments, all content submitted to OrthoChina by users), and to decrease nonsense posts, OrthoChina uses a credit score system. Credit score increases are awarded in several ways: (1) Each user can get one credit score automatically for each primary posting; (2) the

administrator and/or moderator can add more credit score manually based on the quality of the materials; (3) the administrator and moderator can add credit score to the user who gives qualified and valuable replies for discussion; (4) the monthly top three users in posting will be awarded credit scores. Credit scores can be consumed if the user downloads or views the orthopaedic videos, PPT slides, electric orthopaedic textbooks. Users are encouraged to post qualified cases, videos, sharing documents, textbooks, PPT slides. If the post, including the primary post and reply post, is deleted by the moderator or administrator, one of the user's points will be deducted. No posting of advertisements or spam are permitted. If the user continues to post unauthorized advertisements or spam after the moderators' warning, more points will be deducted and if the warning does not stop the user, their IP address will be blocked access to OrthoChina.

Case Presentation Management

Given the variability in experience and skills between participants, guidelines have been established for case presentation. The subject line must be clear and give enough information about case contents. Users are instructed to avoid using only "asking for instruction," "give some advice please," etc. Readers cannot identify the content of cases from such subject lines. Veracity of the case content must be ensured, but the names of patients are not displayed to protect the privacy of the patient. Each case presentation must include textual and imaging information. Text description must include gender, age of the patient, chief complaint, findings on the history and physical examination, prior diagnosis (and treatment), and imaging information which should be clear and complete. For example, if only AP and lateral radiographs are provided for a case of lumbar spondylolisthesis without bilateral oblique view radiographs, or only radiography is submitted for case of cervical spondylosis without MRI images, image information is not complete. Image size is limited to 700 pixels in width, while there are no limitations in image height, and no limitation in the size of the uploaded files. Users are encouraged to provide other imaging information, including video footage of the physical examination or related findings. Other information might include routine blood tests including the erythrocyte sedimentation rate, nonmusculoskeletal imaging examinations such as a chest radiograph, ultrasound of the liver and gallbladder, etc. Each posting should include the author's diagnosis, the questions to be answered, and what the author has learned so far. If patients have undergone surgery, the details should be provided, including surgical method, findings, the postoperative imaging information,

and pathological information if appropriate. (See Appendix 1 for examples of cases discussed in OrthoChina.)

Other Checks

The IP address will be displayed when users log in, and it will be displayed in the post. IP address blocking is applied to users who ignore or violate the OrthoChina rules. Keyword filtering is used to filter sensitive nonorthopaedic submissions or advertisements.

Results

As of December 31, 2007, there were 33,984 registered users, among which 9,759 registered users had passed the confirmation procedures for orthopaedic surgeons in OrthoChina.

We collected the first page monthly and daily clicks from January to December, 2007. The monthly average clicks were 129,906, and daily clicks 4,248 (Figs. 1, 2). For the registered users' visits, there were 6443 visits in a month and an average of 211 visits per day (Figs. 3, 4).

Fig. 1 The first page monthly total clicks from January to December in 2007 were collected. The monthly average clicks were 129,906.

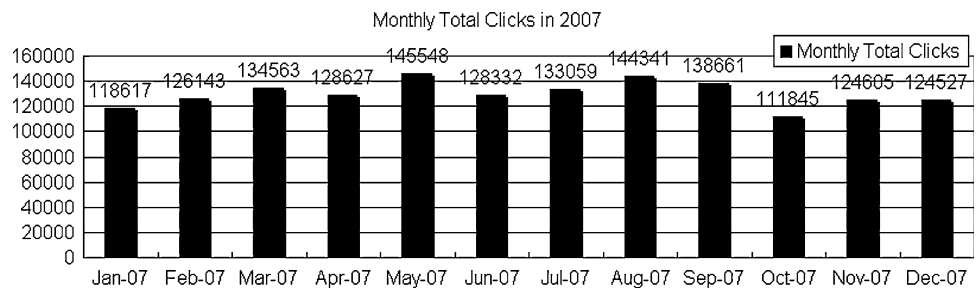


Fig. 2 The first page daily total clicks from January to December in 2007 were 4,248.

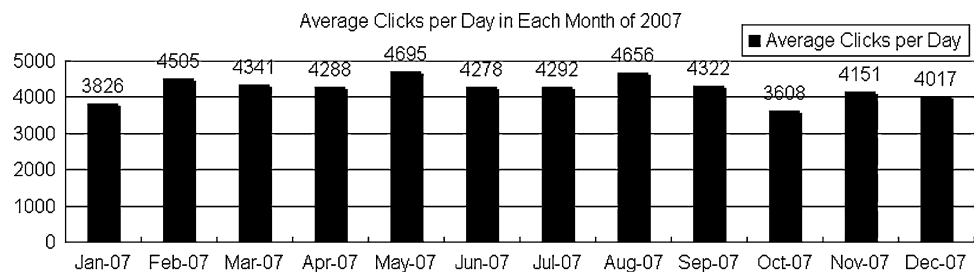


Fig. 3 The monthly total visits of registered users in 2007 were collected. There were 6443 registered user visits on average in a month.

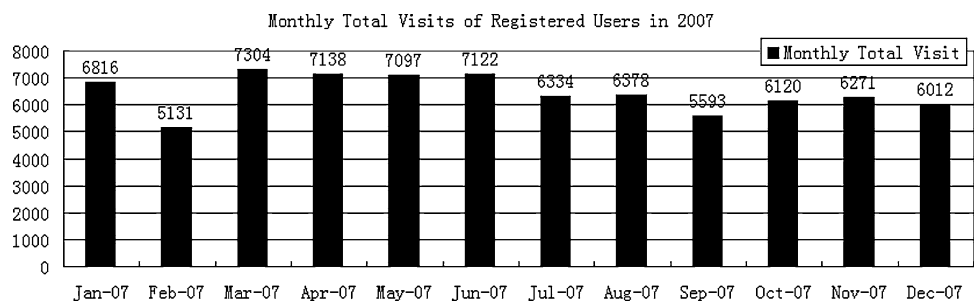


Fig. 4 The average daily visits of registered users in 2007 were collected. There were 211 registered user visits on average per day.

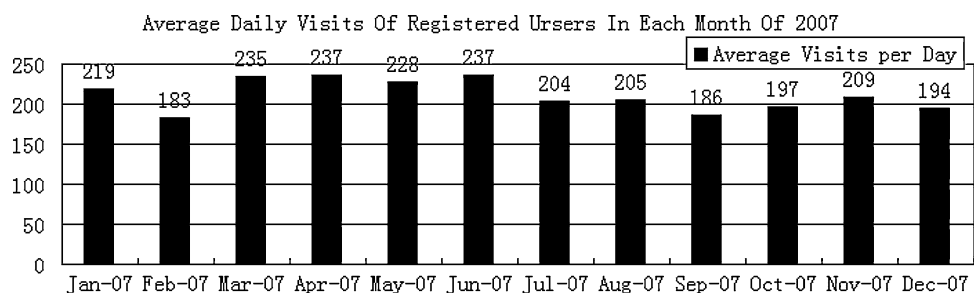


Fig. 5 Monthly total posts in 2007 (including the primary posts and reply posts) were collected. The average monthly posts were 2122.

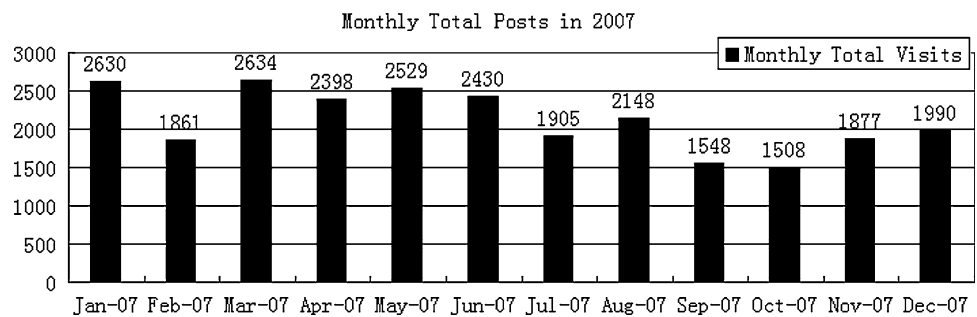
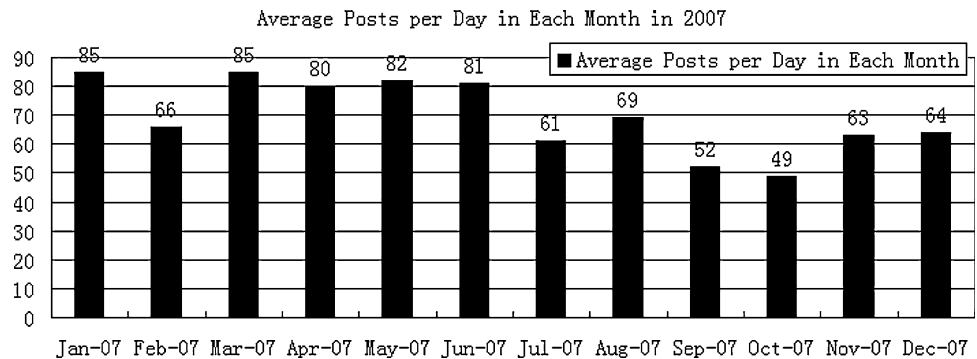


Fig. 6 Average posts per day in each month in 2007 (Including the primary posts and reply posts) were collected. The average posts per day were 70.



There were an average of 2122 monthly posts and an average of 70 daily posts (Figs. 5, 6). Most of the posts for case discussion were presented with required text information and related images. (See Appendix 1 for representative case reports.) For new users who did not know or understand the requirements for case discussion, the moderators of each forum helped the registered orthopaedic surgeons edit images and reminded users to provide required information for each case.

Discussion

In China, most orthopaedists are able to access the Internet with a broadband connection. A specific patient problem is the most common reason for seeking information (See Appendix 1, case 2) among our participants. Due to the language barrier, it is difficult for most orthopaedists in China to read English orthopaedic resources online. No Chinese governmental or official orthopaedic web sites are available for Chinese orthopaedists. We believe OrthoChina provides a valuable resource; using the Internet, orthopaedic surgeons from different employers, geographic regions, and cultures can work together to enhance the quality of care. When an orthopaedist has difficulty in treating complex cases, the cases can be uploaded for consultation from other users of OrthoChina. Multiple opinions can help the caregiver to finalize a treatment plan. In some of the posted cases, complications and/or

inadequate outcomes are highlighted, due to a variety of causes such as technical failure, lack of knowledge, economic reasons, irresponsibility, and others. Cases with a poor outcome may be reviewed by all users to analyze complications, and determine how to improve outcomes of similar cases in the future. Errors in thought process or technical skills may often be recognized by reviewers, and everyone may learn from this process of critical peer review. We also feel this process may enhance patient safety. We encourage users to share information and experiences for teaching and discussion; it is a forum for exchange of ideas. No workshops or meetings can provide such a wide range of topics in the same place in a short time as OrthoChina.

All cases submitted to OrthoChina are classified into subspecialty categories and are stored in a subspecialty database for searching, viewing, and reference. OrthoChina acts as an academic exchange platform with a user-friendly interface, abundant collections of orthopaedic videos, electronic textbooks, PPT files, published papers, and teaching material in many formats, such as Macromedia Flash (Adobe Systems Inc., San Jose, CA) animation and/or video files, etc., which are very useful for didactic, interactive, or self-taught education. At the time of the writing of this article, there were 241 PPT teaching files, 280 electronic textbooks, and 503 orthopaedic videos. There are e-mail lists such as Orthoped Mailing List [30], India Orth Mailing List [13], Trauma-List [38], and other discussion forums [37], but few with quality control or

based on the wiki concept. The OrthoChina project is an international, open, interactive Internet-based orthopaedic Web site using a wiki model for online case discussions. In contrast to the wiki model, it is difficult to control the quality of the users, presentations, and discussions in an interactive listserv forum.

As the Chinese medical system includes practitioners from various formal programs (Western medicine, traditional medicine (traditional Chinese medicine [TCM], Tibetan medicine, Uygur nationality medicine, Mongolian medicine, and medicine of other minorities), and Western medicine plus TCM.), a variety of individuals may care for patients with musculoskeletal injuries. As no subspecialty license in orthopaedics is available in China, it is difficult to verify whether users are orthopaedists or not in online case discussions. The techniques, skills, knowledge, and experience of those practicing orthopaedic surgery vary widely, which makes the musculoskeletal trauma care service quality vary widely [17], often resulting in complications [17]. The first and most important consideration in quality control is how to differentiate the orthopaedist from the nonorthopaedist who wants to register for the forum or mailing list. Users might use their real name with a business-type e-mail address, but they can also use a screen name with a personal e-mail address. The screen name makes it more difficult for moderators to differentiate orthopaedists from nonorthopaedists. For most of the mailing lists and forums, the moderators verify the identity of orthopaedists based on the information the subscriber provides [30, 37]. If the list or forum is a closed one, such as a forum for a given society or organization, it is easy to verify the identity of the subscriber. If it is an open one, however, it is difficult to verify whether the information the subscriber presented is true. In developed countries with well-managed orthopaedic societies such as the United States, it is easy to verify the subscriber's credentials by accessing specific Web sites to see the status of their medical license, or the moderators can call the subscriber's hospital or office [37]. However, for an open orthopaedic mailing list or forum, it is impossible to verify the orthopaedic identity by the way of accessing an orthopaedist license database (as in China, there are no such database for orthopaedist for verification) or by making phone calls. Based on the fact that there is no subspecialty orthopaedic license, OrthoChina uses one of four procedures to confirm the identity of an orthopaedist: (1) an orthopaedic question and answer test; (2) the register's license ID; (3) a colleague's recommendation; or (4) the employer's (hospital's) recommendation.

The second consideration in quality control is managing the interactive discussion. In an e-mail list, such as the Orthopod mailing list [30], all e-mails from subscribers are first sent to all moderators' inboxes. The moderators check

each e-mail one by one to see whether they are true case discussions, orthopaedic academic presentations, or spam emails. The accepted emails are then sent to all list users. All the moderators of the list share this time-consuming, repetitive work. When the first author was one of the moderators of the Orthopod mailing list [30] he found spam emails came in much more than the real case discussion emails. Due to the technical limitations of the mailing list, large-sized images and attachments are not accepted for the list. SpineConnect [37] is open only to board-certified or board-eligible (or the equivalent for each country) surgeons. Most of its users are from United States. If surgeons from other countries want to register in SpineConnect, they must be invited or they have to present their information or their cases and clinical experience to show that they are qualified spine surgeons. The case presentation procedures are guided with preprogrammed forms to check or fill in, but the English interface makes it inaccessible to most of orthopaedists from non-English speaking countries.

The third consideration of quality control is the management of discussions. Good discussions can only develop on the basis of the quality control of the user registration and the case presentation. The mechanism of earning and spending credits, such as OrthoChina has adopted, is not found in other orthopaedic mailing lists and forums.

Based on the orthopaedic subjects and the experience of running the forums, we have created a way to (1) manage case discussion legally; (2) properly select administrative staff members; (3) provide multiformat static orthopaedic information in OrthoChina; (4) allow users registration and orthopaedic surgeon identity confirmation; (5) record the users' online data and provide credit earning and consuming; and (6) allow IP and sensitive word filtering. As of December 31, 2007, there were 33,984 registered users, of which 9759 registered users had passed the confirmation procedures for orthopaedic surgeons. All the cases submitted for discussion are professional reports with the patient's complaint, a physical examination, and relevant images based on the criteria for case discussion submission.

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Appendix I

Case 1

On July 3, 1998, a female patient with thoracic degenerative stenosis and paralysis resulting from spondylotic myelopathy came to the author. She had undergone a traditional Chinese medicine “Mini Needle and Knife” treatment for removing her osteophytes. Before she got the treatment, she could stand and walk. After the “Mini Needle and Knife” treatment, she was paralyzed, was referred to the author’s hospital, accepted posterior laminectomy decompression, and recovered. Upon physical examination the author found 33 small incisions spread over the patient’s back. Some of the incisions healed and some were infected (Appendix Fig. 7). The “Mini Needle and Knife” treatment of traditional Chinese medicine is still popular in China. After this the author started the OrthoChina web site for Web-based education to patients and doctors in orthopaedics via the online case discussion in 1998.

Case 2

On August 10, 2006, the case of a boy with bilateral clubfeet was submitted through OrthoChina for consultation by a remote rural orthopaedist in a county hospital (Appendix Fig. 8). The patient was a newborn, just 10 hours old. After his birth, the deformity of the feet was found by obstetrical and gynecological doctors and the local orthopaedist was asked for consultation. The orthopaedist was going to prescribe a radiographic examination



Fig. 7 The case with thoracic degenerative stenosis and paralysis resulting from spondylotic myelopathy was maltreated with the “Mini Needle and Knife” treatment of traditional Chinese medicine (TCM), which is still popular in China.

for the baby. In this case, as a spine surgeon, the author does not know if radiology studies were best for this newborn, but it is the first case in such early phase to have the opportunity to get online telemedical consultation via the Internet in China. From the reply of pediatric orthopedic surgeons registered in OrthoChina, the recommendation was there was no need for the radiographs and to apply the Ponseti procedure for clubfoot treatment.

Case 3

This case with a humeral bone cyst was pictured August 7, 2004. The bone cyst was treated with a method not previously known (Appendix Fig. 9).

Case 4

This case of L1 fracture instrumentation was x-rayed in March 2006 just after surgery (Appendix Figs. 10, 11). The screws were placed incorrectly in the fractured vertebrae. The instrumentation system might not be used in the main stream of spine surgery, but it is available and still used.

Case 5

The patient was a 60-year-old overweight female. She fell down and felt back pain, but she could walk by herself without any aid. (A) Radiographs were taken and an L1 fracture diagnosed. She was hospitalized locally. She had history of an old spine fracture but was unable to provide



Fig. 8 The case of a 10-hours-old newborn with bilateral clubfoot was submitted for consultation by a remote rural orthopaedist in a county hospital. The pediatric orthopaedist users of OrthoChina recommended the diagnosis of clubfoot and Ponseti procedures for treatment.



Fig. 9 The bone cyst was treated with a method previously unknown. Multiple K-wires were used to fix the bone cyst.



Fig. 10 L1 fracture was instrumented with outdated spinal screw plate instrumentation. The screws were placed incorrectly in fractured vertebrae.

the original radiographs. Without the aid of further investigation, such as MRI scan, to verify if the fracture was new or old, (B) she was treated with femoral traction for 3 days when the author was invited to see the patient. This type of treatment for a compressed lumbar fracture cannot be found in any orthopaedic textbooks.

Even today, we still see more and more incorrect or poorly performed operations. The cases listed in this paper are just a few that appear in the Forum of Failed Cases in OrthoChina.

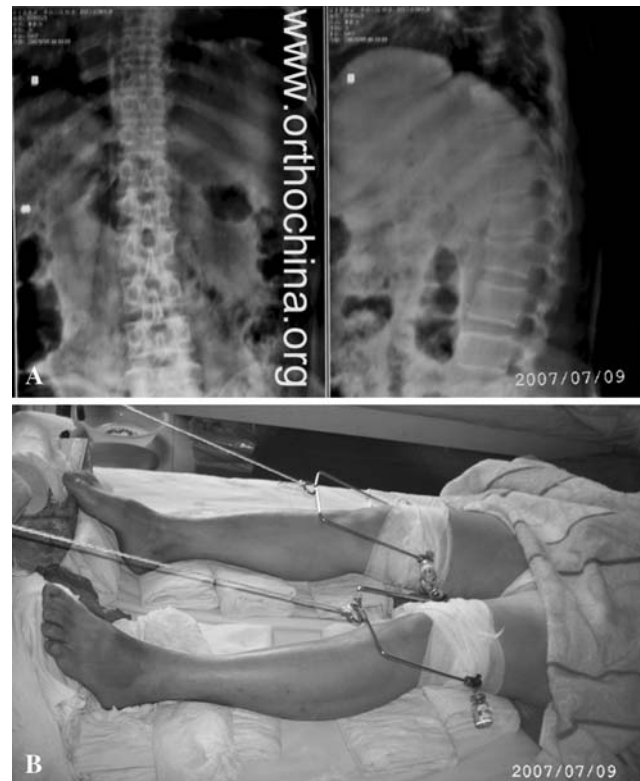


Fig. 11 L1 fracture was incorrectly treated with bilateral femoral traction. (A) AP and (B) lateral radiographs of the lumbar spine showed a slight compression fracture at L1. Bilateral femoral traction was applied.

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