Published in final edited form as:

Otolaryngol Head Neck Surg. 2015 March ; 152(3): 458–464. doi:10.1177/0194599814561187.

Analysis of an Online Match Discussion Board: Improving the Otolaryngology—Head and Neck Surgery Match

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Abstract

Introduction—“The Match” has become the accepted selection process for graduate medical education. Otomatch.com has provided an online forum for Otolaryngology-Head and Neck Surgery (OHNS) Match-related questions for over a decade. Herein, we aim to 1) delineate the types of posts on Otomatch to better understand the perspective of medical students applying for residency and 2) provide recommendations to potentially improve the Match process.

Methods—Discussion forum posts on Otomatch between December 2001 and April 2014 were reviewed. The title of each thread and total number of views were recorded for quantitative analysis. Each thread was organized into one of six major categories and one of eighteen subcategories, based on chronology within the application cycle and topic. National Resident Matching Program (NRMP) data were utilized for comparison.

Results—We identified 1,921 threads corresponding to over 2 million page views. Over 40% of threads related to questions about specific programs, and 27% were discussions about interviews. Views, a surrogate measure for popularity, reflected different trends. The majority of individuals viewed posts on interviews (42%), program specific questions (20%) and how to rank programs (11%). Increase in viewership tracked with a rise in applicant numbers based on NRMP data.

Conclusions—Our study provides an in depth analysis of a popular discussion forum for medical students interested in the OHNS Match. The most viewed posts are about interview dates and questions regarding specific programs. We provide suggestions to address unmet needs for medical students and potentially improve the Match process.

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Conflict of Interest: J.S.G. and S.A.R. are involved in maintaining the Otomatch.com website. S.A.R. manages advertising revenue from the site used for maintenance and development of Otomatch.com. D.J.L. founded the site in 2001.

Keywords

otolaryngology; match; education; Internet; social media

Introduction

Developed to establish a more systematic selection process and to provide medical students with greater decision-making ability, “The Match” has become a widely accepted and celebrated part of the fourth year of medical school.¹ Prior to the widespread implementation of matching services, medical students interviewed for residency positions anytime between the second and fourth year of medical school, and programs notoriously provided minimal time to accept an offer of an internship or residency spot.^{1,2}

Consequently, medical students had limited time to choose a medical specialty and lacked the ability to decide fairly between residency positions. In this context, the National Resident Matching Program (NRMP) was founded in 1952 and quickly grew into the most widely utilized matching service.

Otolaryngology-Head and Neck Surgery (OHNS) trailed other specialties in joining the Match, and literature from the late 1970s demonstrated the specialty-wide debate regarding its merits and limitations.^{2–4} OHNS eventually joined the San Francisco Match (SF Match) service in 1983 and fully transitioned to the NRMP in 2007. Today, OHNS is an increasingly competitive field both in terms of number and quality of applicants,⁵ and leaders in OHNS have begun to discuss how to best manage this surge in interest.⁶

Over the past several decades, investigators have conducted substantial research on not only the mathematical matching algorithm itself, which resulted in a Nobel Prize,⁷ but also the interview and selection process from the perspective of residency programs.^{8–14} Previous research principally sought to find predictors of medical student success both in the Match and as residents. Few studies on the Match beyond surveys, however, have investigated the perspective of medical students, and limited data exist on the interests of medical students in real-time during the Match process.^{15–17}

The Internet has provided new sources of information and support for medical students during the Match process. Otomatch.com was founded in 2001 by Dr. Daniel Lee, one of the co-authors of this report. The site has provided a unique forum for OHNS Match-related questions for well over a decade, and has now witnessed the training of a generation of otolaryngologists. The website is populated by thousands of posts generated by anonymous users and organized by discrete topics in the OHNS Match. The posts and ensuing discussion topics range from information regarding exact interview dates and advice for foreign medical graduates to how to rank programs in a Match list. Analogous Match-related websites, including UncleHarvey (Neurosurgery), Dermboard (Dermatology), UrologyMatch (Urology), Orthogate (Orthopedics) and StudentDoctor (all specialties), also started during the same time period and have likewise risen in popularity as anonymous outlets to discuss Match-related questions. To our knowledge, Otomatch and other Match-related websites have yet to be studied in any formal manner.

Herein, we aim to delineate the types of posts on Otomatch to better understand the perspective of medical students applying for residency in OHNS. Given the longevity of the site and the quantity of posts, as well as its anonymous nature, Otomatch may provide highly relevant insight into unmet needs and interests of medical students applying in OHNS. Further, based on these findings, we aim to provide recommendations on how the Match process might be improved from the perspective of medical students.

Methods and Materials

Institutional review board approval was obtained from the Massachusetts Eye and Ear Infirmary Human Studies Committee. Otomatch.com is a free public website that consists of a home page with overview information on the specialty, an interview calendar website application updated by applicants during the interview season, and a discussion forum intended for use by OHNS residency applicants around the world. This study focused on the discussion forum, which is organized in a hierarchical model: discussion topics, known as “threads,” are generated by users and displayed in an organized fashion (Figure 1). Within each thread, users can post a simple reply or invoke further commentary. The forum tracks the total number of “views” for each thread, thereby providing a direct indication of how much interest a given topic carries. Users can post anonymously as a guest, or they can create an anonymous profile with a username of their choice.

Otomatch archives from December 2001 through April 2014 were retrospectively reviewed for the content of anonymized discussion forums and daily website traffic. The title of each thread and total number of views of each thread were recorded for quantitative analysis. Given the large volume and broad range of topic threads, each thread was organized into six major categories, based on chronology of the application cycle, and eighteen sub-categories. Definitions of major and subcategories categories are listed in Table 1. Categorization was completed by the first three authors. In the event of uncertainty, all three authors discussed the relevant thread and assigned a category based on consensus.

Analysis was performed to quantify interest in each category using two metrics: number of threads and number of views. The number of threads per category provides insight into major discussion points applicants deem relevant in a given application cycle. The number of views provides an estimate of viewership-wide interest in a particular topic. Yearly trends for both of these metrics, stratified for major thread categories, were tabulated and plotted. Time was discretely defined based on application cycles, which begin in the fall and end in the spring of the subsequent calendar year. The top ten sub-categories based on proportion of views and threads were tabulated for the 2013–2014 application cycle.

Website traffic data for the entire Otomatch website, including discussion board archives, were extracted from internal data logs provided by the web-hosting service, Yuku.com, and obtained by the current website manager (S.A.R.). Detailed total number of daily unique Internet protocol addresses, corresponding to views separate in location and time, between October 2009 and March 2014 were compiled and plotted as a heat map to illustrate yearly and monthly trends on Otomatch.

Finally, the NRMP provides publically available online data reports. The total number of OHNS applicants, percent of spots filled, percent of applicants that matched, number of programs and spots per year were tabulated between 2007 and 2014, corresponding to the years during which OHNS has fully participated in the NRMP. Data from these reports were used with permission from the NRMP.

Results

Overall Website Traffic and Trends

Since its inception in early 2001, Otomatch has experienced an increase in traffic (Figure 2). Between December 2001 and April 2014 there were 2,253,451 views and a total of 1,921 threads posted on the Otomatch discussion forum. The total number of threads per application cycle increased 215% between 2001 and 2014. The number of views has increased 300% from 10,250 in 2001 to 306,730 in 2014 (Figure 2). Website views and threads decreased in 2005 and 2006 (nadir of 26,416 views).

Based on Yuku.com usage data there is monthly variation in Otomatch website traffic (Figure 3). Peak views occur between September and December, and a second peak occurs in January. These trends have persisted over time, generally tracking with changes in the evolution of the OHNS Match, including the transition from the San Francisco Match to the National Resident Matching Program.

Topical Trends

Number of threads and views were tabulated according to major topical categories. In terms of major categories, of all threads posted between 2001 and 2014, 40% were related to program specific questions and 27% were discussions about interviews. Views, which provide a surrogate measure for viewer interest and thread popularity, reflected different trends. The majority of visitors viewed threads about interviews (42%), followed by specific program questions (20%; Figure 4). The top ten sub-categories, as quantified by number of threads and views, for the 2013–2014 application cycle are summarized in Table 2. Notably, for both threads and views, interview swaps were both popular (7.9% and 7.0%, respectively). Nevertheless, threads and visits largely reflected similar degrees of website traffic.

Monthly trends in views for each major category for the 2013–2014 cycle are presented in Figure 5. As expected, there was variation coincident with the general timeline of the application process: for example, views related to program questions occur predominantly in October and November and in January and February when applicants are deciding where to interview and where to rank programs, respectively.

The OHNS Match process and the role of Otomatch in supporting discussion among applicants has changed over time. At the inception of Otomatch, the majority of threads and views were related to program-specific questions. Over time, the proportional interest in program-specific questions has decreased and interest in interview-related questions has increased. These trends are graphically represented in Figure 6.

NRMP Data

The total number of OHNS applicants, both from the United States and internationally, increased 20% from 370 in 2007 to 443 in 2014. The number of spots per year, however, has not commensurately increased: 270 spots in 2007 versus 295 spots in 2014 corresponds to a 9% increase.^{5,18} The increase in competition per spot corresponds with a concomitant increase in viewership on Otomatch (Figure 7).

Qualitative Observations

Topic threads spanned a wide range of topics and varied in style from formal questions, social commentary, and casual remarks to humorous asides. The majority of posts center on four major themes: reassurance, clarification, knowledge acquisition and complaints. Users were also observed to make use of the forum to clarify rumors or gossip, frequently posting topic titles that reference a specific program name. Nearly all programs are mentioned in some form, with equal representation from all geographic regions of the United States (data not shown).

Discussion

To our knowledge, this is the first study to investigate the use of an anonymous, long-term, web-based discussion forum in the national residency Match process. The results presented here offer valuable insight into medical student perspectives on the OHNS Match and identify potentially unmet needs. Furthermore, our study demonstrates that Otomatch is a source of support and advice during the OHNS Match process. We show consistent trends in website viewership, which increases in September, peaks in November, and subsides in April, corresponding to the standard NRMP Match period. Visitors to the website most frequently viewed posts related to interview dates. In contrast, visitors most frequently posted topics posing questions about a specific program.

We observed that interest in Otomatch has maintained a strong following and has witnessed a rise in viewership that has mirrored the rise in the number of OHNS applicants. Over this time, we found that the types of views and posts have changed. At the advent of Otomatch, nearly all threads contained questions regarding specific programs. Today, questions are more balanced and topics include the Match itself, interview dates, and pre-application questions. This shift may be the result of a rich and searchable archive of program-specific information over a 13-year period that is stored on the Otomatch website. Similarly, viewers have transitioned from predominantly viewing posts about specific programs to most often viewing posts related to interview dates.

In terms of qualitative findings, Otomatch provides a seemingly safe and anonymous platform for questions that an individual may not feel comfortable asking a medical school peer, resident or faculty member in person. It is evident that users often rely on the website to ask for highly personalized advice, such as whether an applicant is competitive to match, or for personal recommendations, such as following a failure to successfully match in OHNS. There are posts that could be categorized as inflammatory or derogatory; however,

these posts are exceedingly rare, albeit subjective and difficult to quantify. An administrator monitors the forums and deletes postings that are intentionally malicious.

Several major themes were noted after analyzing the data. A major theme evident by Otomatch data is the disorganization in scheduling interviews. The greatest percentage of views on Otomatch detail the specific 2–4 calendar dates a particular program will interview candidates. Typically, a medical student will receive an interview offer from a program providing available dates and then post these dates on the forum for others to see. Applicants want to know when a particular program has sent out an invitation as it may indicate their chances of receiving an interview and may demonstrate a conflict with another program's interview dates. When an applicant receives an interview, he or she must quickly decide which date to schedule based on the chances that it may conflict with a future interview offer from another program. Moreover, as most applicants apply broadly across the country, there is limited time to book travel and reduce costs. Interview dates and dates of interview notification are not reliably available by all programs, and this adds significant logistical stress during the Match process as applicants rush to secure specific interview dates. Similarly, due to the many conflicting interview dates, applicants may try to switch interview dates with each other in order to be able to schedule an interview with another program. Such posts from applicants requesting to switch interview dates with another applicant are popular on Otomatch. In the absence of an official OHNS interview calendar, updates to Otomatch by medical students provide a piecemeal interview calendar and enable some margin of flexibility in the interview scheduling process.

Another theme of Otomatch data is a sense of applicants lacking insight and information about specific programs. Each year, program specific questions garner a large percentage of dedicated threads and are commonly viewed. These posts frequently inquire about the operative case volume, faculty depth, and research opportunities. Applicants solicit advice about program comparisons, especially in major metropolitan areas where numerous programs co-exist. These types of relatively basic questions repeat year after year on Otomatch, revealing an absence of standardized information for each residency program. The information provided on Otomatch by website visitors may well influence applicants' decision to apply to or rank highly a specific residency program. Otomatch, is an anonymous website and the veracity of posts or responses cannot be determined by responding individuals or third party readers. There is, thus, the obvious potential for both misinformation and misleading information on a range of topics, which is inherent to any Internet website that relies on anonymous posting.

Based on the review of our data, we provide several ideas to potentially improve the Match process for both medical students and OHNS residency programs. First, most programs have started offering interview notification dates at a mutually agreed upon deadline based on the recommendations of the Otolaryngology Program Directors Organization and the Association of Academic Departments of Otolaryngology – Head and Neck Surgery (AAO-HNSF). These dates should be made public knowledge and clearly posted. Beyond knowing the actual interview dates, knowing when an applicant may potentially receive a response from a program about interview status is equally important as it influences interview scheduling and travel plans. These dates, for both interviews and notifications, could be

made public by the AAO-HNSF. As an example, The Society of Neurological Surgeons posts a list of interview dates, residency positions, and contact information in advance of each interview season. In the 2013–2014 Match cycle, 102 Neurosurgery programs out of 102 total programs provided basic interview information.^{5,19}

Second, while anonymous posts make sense to protect the identity of medical students submitting queries, it would be more helpful if the responses to many questions came from a set of vetted and knowledgeable individuals from the OHNS community. This is especially the case for questions related to specific OHNS residency programs. Perhaps a mechanism should be created for OHNS programs to provide non-anonymous responses to program specific questions.

Finally, a simple, standardized “fact sheet” or description of programs, including basic information, such as number of full-time academic faculty, current residents, affiliated hospitals, and standard rotations might be helpful for medical students with questions about particular programs. Today, programs provide varying degrees of this type of information on individualized hospital- and department-based websites; however, there is no centralized location for residency program information. Basic programmatic information has been posted by several OHNS fellowships through affiliated societies and may serve as examples.^{20,21} Collectively, these suggested changes may enable medical students to be more informed, allow them to identify interview date conflicts early, decrease the administrative burden on applicants and programs, decrease the cost of travel, and ultimately apply more selectively to OHNS programs.

There are several significant limitations of our study. Principally, the anonymous nature of the Otomatch forum renders it impossible to know if all individuals that visit or post on the website are truly medical students or even part of the OHNS community. Further, although programs within each region of the United States are discussed on the website, the demographics and geographic diversity of the viewership is unclear. Finally, it is unknown if there is a small group of dedicated users to the site or if participation is widespread among applicants. Therefore, it is difficult to make conclusions that the data herein are reflective and generalizable to the entire applicant pool. Nevertheless, based on the specific nature of topics, the quality and timing of the posts online, and the general consistency in topics addressed from year to year, it is clear that Otomatch continues to be a widely recognized and utilized website for the OHNS Match process.

Understanding the inherent weakness of the data, Otomatch provides a litmus test for concerns of medical students interested in applying in OHNS over the past decade. Viewership on the website indicates the rough timeline for concerns relating to the Match and when to best capture student concerns. Further, these data demonstrate an increasingly high demand for information on the simple logistical issues of interview timing and specific program questions. These findings may lay the groundwork for both changes in how information is distributed at the program and national level. Future studies could focus on whether discrete interventions, such as those suggested herein, can improve the Match process for both applicants and residency programs.

Conclusions

Our study provides an in depth analysis of a popular discussion forum for medical students interested in the OHNS Match. Information on interview dates and specific programs constitute the majority of posts. We provide suggestions to address unmet needs for medical students and potentially improve the OHNS Match process.

Acknowledgments

Source of Funding: None

We would like to thank Alyson Kaplan of Boston University for her careful review and analysis of National Resident Matching Program data.

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Visits by Month and Year

Figure 1. Viewership of Otomatch

Figure 1A: total number of threads and non-unique views between 2001 and 2014. Figure 1B: heat map of unique visitors (October 2009 to March 2014). Note: data courtesy of Yuku.com.

Figure 2. Threads and views tabulated according to major topic categories

Fig 2A and B: Quantification of types of posts on Otomatch, called “Threads”. Fig 2C and D: Quantification of types of posts on Otomatch, called “Views”. Proportional interest in different categories varies significantly over time ($p < 0.0001$)

Figure 3. Monthly trends in major category views during 2013–2014 application cycle
Figures demonstrate shift in number of views of specific categories over a yearlong Match cycle.

Figure 4. Otomatch viewership as related to total number of applicants and total number of spots for otolaryngology (2007–2012)

OHNS residency spots per year has not commensurately increased with the increasing number of applicants. This resultant increase in competition per spot corresponds with an increase in viewership on Otomatch.

Table 1

List of major and sub-categories.

Major Category	Sub Categories
Pre-application	<ol style="list-style-type: none"> 1 Applicant advice 2 Away electives 3 Board scores 4 Applicant competitiveness 5 Letters of recommendation
Program questions	<ol style="list-style-type: none"> 1 Specific questions about program curriculum or resident experiences 2 Program rankings 3 Program comparisons
Interviews	<ol style="list-style-type: none"> 1 Interview dates 2 Interview advice 3 Interview swaps 4 Number of interviews needed to match 5 Hotel and ride sharing
Ranking	<ol style="list-style-type: none"> 1 How to rank programs 2 Communication from/to programs 3 Final rank lists
Match	<ol style="list-style-type: none"> 1 Match results 2 Failure to match/questions about the Supplemental Offer and Acceptance Program/reapplicants
Miscellaneous	

Table 2

List of top ten sub-categories by total number of threads and views for the 2013–2014 application cycle.

Thread sub-category	Percent of total threads
Specific program question	18.3
Interview swaps	7.9
Interview advice	6.1
Program comparisons	5.5
Interview dates/calendar	4.9
Failure to match/SOAP [*] /reapplicants	4.3
Communication from/to programs post-interviews	4.3
Match results	3.7
Applicant advice	3.1
Away electives	2.4

Thread sub-category	Percent of total views
Interview dates/calendar	43.9
Specific program questions	8.2
Interview swaps	7.0
Program comparison	3.6
Interview advice	3.4
Final rank list	3.4
Match results	3.1
Failure to match/SOAP [*] /reapplicants	2.9
Number of interviews needed to match	2.7
Communication from/to programs post-interviews	2.2

* Supplemental Offer and Acceptance Program