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Bridging the Gap in Global Advanced Radiation Oncology Training: Impact of a Web-Based Open-Access Interactive Three-Dimensional Contouring Atlas on Radiation Oncologist Practice in Russia

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Abstract

Radiation oncologists in Russia face a number of unique professional difficulties including lack of standardized training and continuing medical education. To combat this, under the auspices of the Russian Society of Clinical Oncology (RUSSCO), our group has developed a series of ongoing in-person interactive contouring workshops that are held during the major Russian oncology conferences in Moscow, Russia. Since November 2016 during each workshop, we utilized a web-based open-access interactive three-dimensional contouring atlas as part of our didactics. We sought to determine the impact of this resource on radiation oncology practice in Russia. We distributed an IRB-approved web-based survey to 172 practicing radiation oncologists in Russia. We inquired about practice demographics, RUSSCO contouring workshop attendance, and the clinical use of open-access English language interactive contouring atlas (eContour). The survey remained open for 2 months until November 2017. Eighty radiation oncologists completed the survey with a 46.5% response rate. Mean number of years in practice was 13.7. Sixty respondents (75%) attended at least one RUSSCO contouring workshop. Of those who were aware of eContour, 76% were introduced during a RUSSCO contouring workshop, and 81% continue to use it in their daily practice. The greatest obstacles to using the program were language barrier (51%) and internet access (38%). Nearly 90% reported their contouring practices changed since they started using the program, particularly for delineation of clinical target volumes (57%) and/or organs at risk (46%). More than 97% found the clinical pearls/links to cooperative group protocols in the software helpful in their daily practice. The majority used the contouring program several times per month (43%) or several times per week (41%). Face-to-face contouring instruction in combination with open-access web-based interactive contouring resource had a meaningful impact on perceived quality of radiation oncology contours among Russian practitioners and has the potential to have applications worldwide.

Keywords RUSSCO · eContour.org · Russia · Clinical target volume · Organs at risk · Radiation oncology · Global oncology

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Introduction

One of the tangible hindrances to improving global oncology care is the training gap in the field of Radiation Oncology between countries with formal multi-year dedicated residency programs and countries lacking these programs. Under the auspices of the Russian Society of Clinical Oncology (RUSSCO), our group has developed a series of ongoing in-person contouring workshops that are held during the major Russian oncology conferences in Moscow, Russia, to help radiation oncologists lacking formal multi-year dedicated residency programs [1]. The first workshop was held in February 2016, and since then, a total of nine workshops have been conducted. On November 17, 2016, during the 3rd workshop, which was dedicated to esophageal and gastric cancer, we introduced the audience to the open-access web-based contouring program (eContour), as a visual aid during the workshop and also as a tool that physicians could use in daily practice. The eContour program was previously demonstrated to improve the quality of target delineation among US radiation oncology residents, and we sought to determine the impact of this open-access interactive contouring atlas on Russian radiation oncologists [2]. This report summarizes the preliminary self-reported impact of the contouring program on the practice behavior of Russian radiation oncologists.

Materials/Methods

An online survey was approved by our Institutional Review Board and distributed on September 4, 2017 to 172 practicing radiation oncologists in Russia. The database was created based on physician registration history in various educational conferences held in Russia over the past 5 years. Questions pertained to RUSSCO contouring workshop awareness/attendance, and the impact of utilizing a free English language internet-based contouring program (eContour) in clinical practice among additional demographic factors. All participants were contacted by email and invited to complete the survey, which was hosted by SurveyMonkey; reminder emails were sent on September 18, 2017 and October 9, 2017. The survey was closed in November 2017; results were translated from Russian to English for descriptive analysis.

Results

Nine contouring workshops have taken place-to-date; 80 radiation oncologists completed the survey, resulting in a 46.5% response rate. The respondents practiced independently on average for 13.7 years. 71.4% had attended at least one RUSSCO contouring workshop, the most popular being head and neck, breast, esophagus/stomach, and uterine cervix. More than 75% learned of the internet-based contouring program through a RUSSCO contouring workshop; of those familiar with the contouring program, more than 80% used it in their practice. Seventy-six percent of eContour users stated that they feel comfortable using the program independently; the other 24% prefer to be taught how to use the program operation during the in-person contouring workshops.

The largest obstacles to using the program were language barrier (51%) and reliable, high-speed internet access (38%). Eighty-nine percent of providers reported their contouring practices changed since they started using the program, particularly in terms of delineation of clinical target volumes (57%) and organs at risk (46%) (Fig. 1). More than 97% found the clinical pearls and direct links to cooperative group protocols imbedded in the software to be helpful in their daily practice. The majority used the contouring program either several times per month (43%) or several times per week (41%). The most common additional functions of the contouring program desired by responders were the "ability to create own contours and then compare them to expert contours", followed by "review of not just one, but several contours related to a particular disease site", and "contours from various sources (different cancer centers, different experts, different countries)".

Discussion

To help counteract the radiation oncology residency training deficit in Russia, RUSSCO has conducted nine contouring workshops in Moscow between February 2016 and

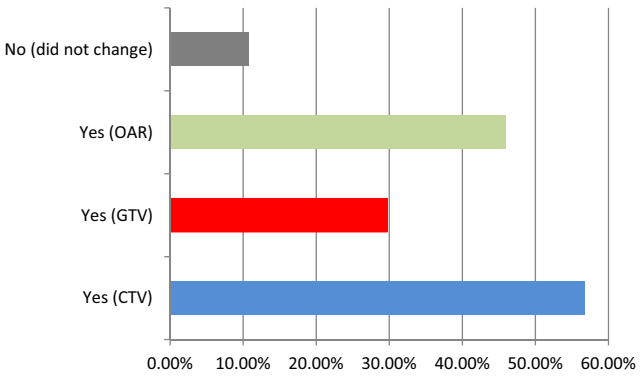

Fig. 1 Self-reported change in Russian radiation oncologists' daily practice as a result of utilization of an open-access web-based three-dimensional contouring atlas. OAR, organs at risk; GTV, gross tumor volume; CTV, clinical target volume

November 2017, each focusing on a different organ system. Thus far, topics have included head and neck, lung, breast, esophagus and stomach, uterine cervix, hepatocellular carcinoma, brain, and prostate [3, 4]. After the first two workshops, it became apparent that Russian physicians needed a more longitudinal exposure to the state-of-the-art contouring examples as well as access to modern clinical protocols.

Several studies involving multiple disease sites have shown that there exists significant interobserver variability in contouring among radiation oncology providers; this variability can be reduced with contouring reference aids [5–9]. The eContour program was developed as a free web-based interactive contouring atlas to aid the translation of practice guidelines into routine clinical practice [2, 10]. Since eContour was previously demonstrated to improve the quality of target delineation among US radiation oncology residents [2], we hypothesized that introduction of Russian radiation oncologists to this free website program during the workshop would assist not only during the workshop, but will also be used as a resource that physicians can use in their daily practice, including the disease sites that have not yet been covered by the RUSSCO contouring workshops.

Our analysis shows that 75% of respondents learned about the website through the attendance of RUSSCO contouring workshops. Moreover, over 80% of registered users are using the program in their daily practice.

Our findings indicate that the combination of in-person contouring workshops with a free internet-based contouring program has increased the exposure of Russian radiation oncologists to up-to-date contouring guidelines and practices. Although limited by language barrier and internet access, the contouring program (eContour.org) has impacted the contouring of nearly 90% of its users in clinical practice, specifically for clinical target volumes and organs at risk delineation; nearly all users found the clinical pearls and access to clinical protocols a useful feature for their clinical practice. Over 75% of respondents feel that they can use the software independently. This is an important and replicable step in bridging the knowledge gap for countries without dedicated radiation oncology residency training, and has significant implications for optimization of radiation oncology practice worldwide.

Compliance with Ethical Standards

Conflict of Interest Dr. Gillespie is a co-founder of eContour. Dr. Mitin receives research funding from Novocure. No other author has any pertinent conflicts of interest or disclosures.

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