



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



COVID-19 Rapid Letter

A national survey on radiation oncology patterns of practice in Switzerland during the COVID-19 pandemic: Present changes and future perspectives [☆]



Vérane Achard ^a, Daniel M. Aebersold ^b, Abdelkarim S. Allal ^c, Nicolaus Andratschke ^d, Brigitta G. Baumert ^e, Karl T. Beer ^f, Michael Betz ^g, Thomas Breuneval ^h, Stephan Bodis ⁱ, Bernardino de Bari ^j, Robert Förster ^k, Alessandra Franzetti-Pellanda ^l, Matthias Guckenberger ^d, Evelyn Herrmann ^m, Constance Huck ^a, Kaouthar Khanfir ⁿ, Oscar Matzinger ^o, Nicolas Peguret ^p, Gianfranco Pesce ^q, Paul M. Putora ^r, Christiane Reuter ^s, Antonella Richetti ^q, Hansjörg Vees ^t, Conny Vrieling ^p, Kathrin Zaugg ^u, Frank Zimmermann ^v, Daniel R. Zwahlen ^k, Pelagia Tsoutsou ^{a,w,*}, Thomas Zilli ^{a,w,*}

^a Department of Radiation Oncology, Geneva University Hospital; ^b Department of Radiation Oncology, Inselspital, Bern University Hospital, University of Bern; ^c Department of Radiation Oncology, Cantonal Hospital of Fribourg – HFR; ^d Department of Radiation Oncology, University Hospital Zürich and University of Zürich; ^e Department of Radiation Oncology, Kantonsspital Graubünden, Chur; ^f Radiation Oncology Center, Bienne-Seeland-Jura Bernois; ^g Department of Radiation Oncology, Hirslanden Clinique Bois-Cerf, Lausanne; ^h Department of Radiation Oncology, Hôpital de La Tour, Geneva; ⁱ Department of Radiation Oncology, KSA-KSB, Kantonsspital Aarau; ^j Department of Radiation Oncology, Réseau Hospitalier Neuchâtelois, La Chaux-de-Fonds; ^k Department of Radiation Oncology, Cantonal Hospital of Winthertur; ^l Department of Radiation Oncology, Clinica Luganese Moncucco, Lugano; ^m Department of Radiation Oncology, Hôpital Riviera-Chablais, Rennaz; ⁿ Department of Radiation Oncology, Hôpital du Valais, Sion; ^o Department of Radiation Oncology, Clinique de Genôlier - Centre Médical des Eaux Vives, Geneva; ^p Department of Radiation Oncology, Hirslanden Clinique Grangettes, Geneva; ^q Department of Radiation Oncology, Oncology Institute of Southern Switzerland, Bellinzona; ^r Department of Radiation Oncology, Cantonal Hospital of St. Gallen, St. Gallen and Department of Radiation Oncology, University of Bern; ^s Department of Radiation Oncology, Spital Thurgau AG, Kantonsspital Frauenfeld und Münsterlingen; ^t Radiotherapy Institute, Hirslanden Klinik, Zürich; ^u Department of Radiation Oncology, City Hospital Triemli, Zürich and Department of Radiation Oncology, University of Bern; ^v Department of Radiation Oncology, University Hospital Basel; and ^w Faculty of Medicine, Geneva University, Switzerland

The outbreak of the novel coronavirus disease-19 (COVID-19) has rapidly and drastically impacted worldwide the healthcare system. Despite an increasing number of recommendations becoming available in the last two months, measures adopted in radiation-oncology departments to overcome this situation are rapidly changing and may differ largely based on institutional and national practices.

We conducted a national survey of all radiation oncology centers in Switzerland to better understand the early impact of the COVID-19 pandemic on our discipline.

Methods

A 53-questions online survey was finalized on April 6th, 2020 using available recommendations [1–8] and distributed by email on April 07th, 2020 to the representatives of the 30 Swiss radiation

oncology departments. The survey was finalized on April 24th, 2020 with answers from 22 out of 30 Swiss radiation oncology departments (Suppl. Fig. 1).

Results

Up to April 7th, 2020, approximately half (45%, 10/22) of the Swiss radiation-oncology departments had been confronted with patients diagnosed with COVID-19, with 73% of the centers (16/22) experiencing a reduction of their daily activity (Suppl. Figs. 1 and 2). As far as human resources were concerned, 18% of the departments suffered from staff shortage (4/22), with COVID-19 infection among staff members observed in 5 out of 22 centers (23%), and part/full-time shift of collaborators in a COVID-19 unit imposed in 6 out of 22 centers (27%).

Dedicated IT solutions for the COVID-19 crisis were implemented in all institutions. Remote access to the treatment planning workstations was available for staff members in 19 out of 22 centers (91%) and allowed for majority of the teams (17/22, 81%) to practice split staffing. In hospitals, the use of medical masks for all healthcare professionals was common practice in almost all centers (91%, 19/22).

For patient's care, remote consultations were offered whenever possible in all centers. When a physical presence in the department was necessary, patients were screened at the hospital entrance in more than 70% of the centers (16/22). Moreover, patient zoning based on COVID-19 status was proposed in 19 centers (86.4%).

[☆] The Editors of the Journal, the Publisher and the European Society for Radiotherapy and Oncology (ESTRO) cannot take responsibility for the statements or opinions expressed by the authors of these articles. Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds or experiments described herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made. For more information see the editorial "Radiotherapy & Oncology during the COVID-19 pandemic", Vol. 146, 2020.

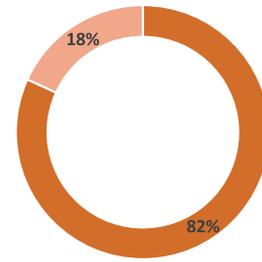
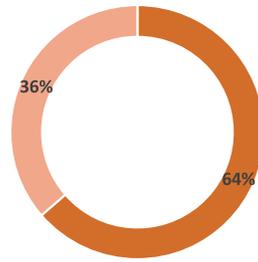
* Corresponding author at: Radiation Oncology Department, Geneva University Hospital, CH-1211, Geneva 14, Switzerland.

E-mail address: Thomas.Zilli@hcuge.ch (T. Zilli).

A

Use of hypofractionated schedules RT for breast cancer (all stages)?

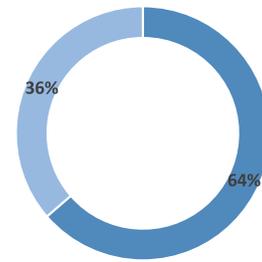
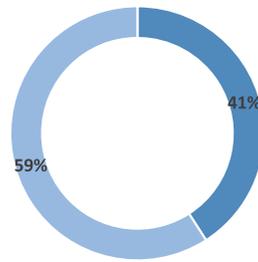
■ Yes
■ No



B

Routine use of short-course neoadjuvant RT for rectal cancer?

■ Yes
■ No



BEFORE PANDEMIC

DURING PANDEMIC

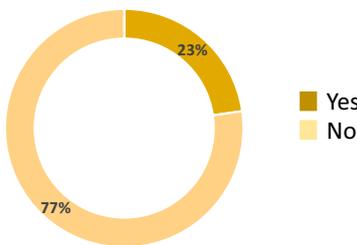
Fig. 1. Use of hypofractionation for breast (A) and rectal cancer (B) before and during COVID-19 pandemic.

Medical masks were mandatory for all patients in 59% of the centers (13/22), reserved for patients with symptoms in 36% of the centers (8/22), while one center (5%) did not recommend any protective equipment.

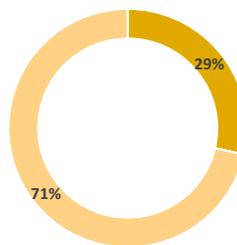
For prostate cancer, radiotherapy treatment in the primary setting was delayed if not considered detrimental for low- and favorable intermediate-risk disease in almost all participating centers (90.9%, 20/22). The use of a neoadjuvant treatment up to an expected resolution of the peak of the pandemic was recom-

mended by the 82% of the centers (18/22) if a concomitant androgen deprivation treatment (ADT) was indicated. For high-risk disease patients diagnosed during the pandemic, radiotherapy combined with ADT was the preferred treatment option recommended by the local tumorboards in 18/22 of the centers (82%). The proportion of centers using hypofractionated schedules for prostate cancer patients remained approximately the same, 86% (19/22) before and 91% (20/22) during pandemic. No shift towards an increased use of extreme hypofractionation was observed dur-

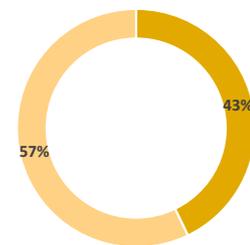
A *Hypofractionated schedules for head and neck cancer patients in the curative setting?*



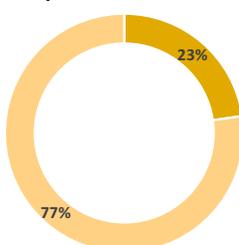
B *Omission of RT and treatment with temozolomide alone for patients aged of > 60 years with methylated glioblastoma ?*



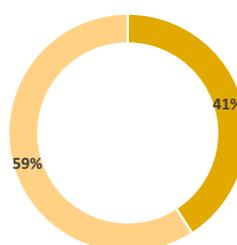
C *More frequent use of the 40 Gy/15fx schedule over the 60 Gy/30fx schedule for healthy and young glioblastoma patients?*



D *Omission of prophylactic cranial irradiation and/or consolidation thoracic RT in small cell lung cancers patients?*



E *Favor medical treatment optimization over palliative RT for uncomplicated painful bone metastases?*



F *More single fraction prescription for palliative RT treatments for symptomatic metastasis*

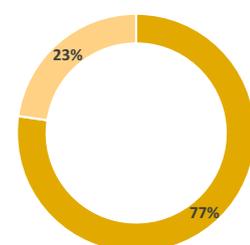


Fig. 2. Survey questions for non-prostate, non-breast disease sites. (RT, Radiotherapy).

ing the pandemic, with rates of centers using moderate or extreme hypofractionation, or both modalities, remaining stable over time (moderate: 50%, 11/22 vs. 55%, 12/22; extreme: 9%, 2/22 vs. 9%, 2/2; moderate + extreme: 27%, 6/22, vs. 27%, 6/22, before and during pandemic, respectively).

For breast cancer, during the COVID-19 pandemic half of the centers (11/22, 50%) omitted radiotherapy boost unless the patient presented with significant risk factors of relapse (≤ 60 years, high-grade tumors, inadequate margins). In 2 out of 22 centers (9%), radiotherapy was omitted for patients aged ≥ 65 years, with invasive breast cancer < 30 mm, with clear margins, grade 1–2, estrogen receptors (ER)+, HER2–, and node negative disease, who were planned for treatment with endocrine therapy. Lastly, none of the centers omitted radiotherapy for ductal carcinoma in situ (DCIS) breast cancer. The use of upfront endocrine therapy to delay radiotherapy initiation for breast cancer patients with ER+ cancer, either DCIS or invasive, was adopted by 50% of the centers. Compared to the pre-pandemic period, there was an 18% increase (from 64%, 14/22 to 82%, 18/22) in the rate of centers using moderate hypofractionation (i.e., 42.5 Gy/16 fx or 40 Gy/15 fx) for the majority of patients (all stages; intact breast and post-mastectomy and/or regional nodal irradiation) (Fig. 1A). Extreme hypofractionated schedules (i.e., 26 Gy/5 fx daily or 28.5 Gy/5 fx once-weekly, as per the FAST and FAST Forward trials, respectively [9,10] were adopted in one center (5%).

Short course radiotherapy was the preferred neoadjuvant treatment for rectal cancer, with a 23% increase during the pandemic (from 41%, 9/22 to 64%, 14/22) (Fig. 1B). For other disease sites, with the exception of palliative radiotherapy for symptomatic bone metastases, no clear change of practice was observed (Fig. 2).

Discussion

This survey provides a snapshot of the April 2020 status of the Swiss radiation oncology departments following the COVID-19 outbreak and highlights three major aspects.

First, confronted with the current pandemic, all radiation oncology departments were able to rapidly implement telemedicine. Second, all centers were able to reorganize institutional practices, with creation of zoning and use of dedicated protective equipment for patients and medical staff. Third, delay of radiotherapy treatments with hormonal manipulations when possible, associated with an increased use of hypofractionation for breast, rectal cancer and palliation were the pragmatic responses of the majority of the centers to the pandemic.

Our work faces the limitation associated with reporting the evolution of radiation oncology practices in the earliest stages of the pandemic, when ASTRO/ESTRO recommendations for lung and head and neck cancer [11,12] were not yet published, with an unequal number of online resources available for participants depending on when they answered the survey (Suppl. Fig. 3). Moreover, a single country survey risks to be influenced by several aspects, including national-specific clinical practices, the health-care reimbursement system, and the influence of governmental legislations undertaken during the pandemic. Nevertheless, valuable information is emerging from this report which may provide basis to better understand the actual and future impact of COVID-19 pandemic on our discipline.

Conflict of interest

The authors report no conflict of interest.

Funding

None

Acknowledgements

The authors wish to thank the all the members of the Society of Swiss Radiation Oncologists (SRO) and the Scientific Association of Swiss Radiation Oncology (SASRO) for their contribution to this work.

All data generated and analyzed during this study are included in this published article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.radonc.2020.05.047>.

References

- [1] COVID-19 rapid guideline: delivery of radiotherapy. NICE guideline. <https://www.nice.org.uk/guidance/ng162>.
- [2] Al-Rashdan A, Roumeliotis M, Quirk S, Grendarova P, Phan T, Cao J, et al. Adapting radiation therapy treatments for patients with breast cancer during the COVID-19 pandemic: hypo-fractionation and accelerated partial breast irradiation to address World Health Organization Recommendations. *Adv Radiat Oncol* (2020).
- [3] Braunstein LZ, Gillespie EF, Hong L, Xu A, Bakhoun SF, Cuaron J, et al. Breast radiotherapy under COVID-19 pandemic resource constraints – approaches to defer or shorten treatment from a Comprehensive Cancer Center in the United States. *Adv Radiat Oncol* 2020.
- [4] Coles CE, Aristei C, Bliss J, Boersma L, Brunt AM, Chatterjee S, et al. International guidelines on radiation therapy for breast cancer during the COVID-19 pandemic. *Clin Oncol* 2020;32:279–81.
- [5] Dietz J, Yao K, Kurtzman S, Anderson BO, Willey S, Boolbol S, Richard Bleicher, et al. Recommendations for prioritization, treatment and triage of breast cancer patients during the COVID-19 pandemic: executive summary <https://www.facs.org/quality-programs/cancer/executive-summary>.
- [6] Marijnen CAM, Peters F, Rödel C, Bujko K, Haustermans K, Fokas E, et al. International expert consensus statement regarding radiotherapy treatment options for rectal cancer during the COVID 19 pandemic. *Radiother Oncol* 2020;148:213–5.
- [7] Yerramilli D, Xu A, Gillespie E, Shepherd A, Beal K, Gomez D, et al. Palliative radiotherapy for oncologic emergencies in the setting of COVID-19: approaches to balancing risks and benefits. *Adv Radiat Oncol* 2020.
- [8] Zaorsky NG, Yu JB, McBride SM, Dess RT, Jackson WC, Mahal BA, et al. Prostate Cancer Radiotherapy Recommendations in Response to COVID-19. *Adv Radiat Oncol* 2020.
- [9] Agrawal RK, Alhasso A, Barrett-Lee PJ, Bliss JM, Bliss P, et al. First results of the randomised UK FAST Trial of radiotherapy hypofractionation for treatment of early breast cancer (CRUKE/04/015). *Radiother Oncol* 2011;100:93–100.
- [10] Brunt AM, Haviland JS, Wheatley DA, Sydenham MA, Alhasso A, Bloomfield DJ, et al. Hypofractionated breast radiotherapy for 1 week versus 3 weeks (FAST-Forward): 5-year efficacy and late normal tissue effects results from a multicentre, non-inferiority, randomised, phase 3 trial. *Lancet* 2020.
- [11] Guckenberger M, Belka C, Bezjak A, Bradley J, Daly M, DeRuysscher D, et al. Practice recommendations for lung cancer radiotherapy during the COVID-19 pandemic: An ESTRO-ASTRO consensus statement. *Radiother Oncol* 2020;146:223–9.
- [12] Thomson D, Palma D, Guckenberger M, Balcermpas P, Beitler J, Blanchard P, et al. Practice recommendations for risk-adapted head and neck cancer radiotherapy during the COVID-19 pandemic: an ASTRO-ESTRO consensus statement. *Int J Radiat Oncol Biol Phys* 2020.
- [13] Office Fédéral de la Santé Publique. Covid-19 en Suisse. <https://covid-19-schweiz.bagapps.ch/fr-1.html>.