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Orthopaedic surgeons do not consult radiology reports. Fact or fiction?

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ABSTRACT

Purpose: To find out how orthopaedic surgeons handle radiological reports and to identify ways to improve musculoskeletal radiology service and interdisciplinary communication.

Method: An anonymised 14-question online survey was distributed among 27 orthopaedic departments in German-speaking parts of Europe. It was available to trainees and consultants between 22/10/2020 and 05/06/2021. The questionnaire collected information regarding the participants' habits of consulting radiology reports depending on the imaging modality, reasons for not reading reports and asked for improvement recommendations for the radiology service.

Results: 81 orthopaedists participated. 20% would never consult a plain radiograph report. In contrast, only 4% would never consult a CT report and no one claimed to never consult an MRI report. 43%, 67% and 86% would routinely consult radiology reports of radiographs, CT and MRI studies, respectively. Long time to report availability (24%), a general lack of time (19%) and too long texts (17%) were the most popular reasons for not consulting the reports. 62% of participants voted to sometimes disagree with the reports and in cases of opinion discrepancy 51% would always or often contact the radiologist. 64% preferred to be informed directly via phone about relevant unexpected findings. Most popular report improvement recommendations were more rapid report availability (24%), inclusion of significant images (19%) and inclusion of more angle and distance measurements (16%). In the free text column, a desire for direct interdisciplinary discussion of equivocal cases was often stated (30%).

Conclusions: Concluding, this survey showed that orthopaedic surgeons routinely consult radiology reports. The participants expressed a desire for increased, direct interdisciplinary communication to solve equivocal cases and improve patient care.

1. Introduction

Modern medicine is no longer conceivable without radiology. Every clinical subspecialty uses imaging methods to facilitate diagnostics and improve patient management. On the one hand, the increased exposure to imaging in the daily clinical routine has led to improved image interpretation skills of referring physicians. On the other hand, the radiologists themselves have over the years increasingly faded into the background, often with only little patient contact and moderate interaction with referring colleagues [1].

Orthopaedic surgery is one of the subspecialties where imaging is ubiquitous. Therefore, it has become common practice of orthopaedists to assess radiology images of their patients. The development of expertise in image interpretation of this specialised referrer group have led to the common perception among radiologists, that orthopaedic surgeons are only interested in the acquired, original imaging data. It is conceived that the written radiology report is not or only rarely consulted by these experts.

Scarce literature is available on this topic to validate or dismiss this conception [2]. Knowledge of the habits of orthopaedic surgeons

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regarding handling of radiology reports can improve image reporting practice and interdisciplinary communication, facilitating patient care [3–5].

The aim of this study was to find out how orthopaedic surgeons handle radiological reports and to identify ways to improve musculoskeletal radiology service and interdisciplinary communication.

2. Materials and methods

A taskforce of six radiologists, including four board-certified consultants, three of them specialised in musculoskeletal imaging, and two clinical musculoskeletal imaging fellows phrased questions for a brief survey among orthopaedists. The goal was to find a compromise between maximum information yield on handling of radiology reports and minimum time requirement for the participants to increase the return rate. Eventually, a 14-question document was produced as shown in Table 1.

Using the *SurveyMonkey*© (SurveyMonkey Europe UC, Dublin, Ireland) web service, the survey was created and a hyperlink for online access was generated. The hyperlink was distributed among 27 orthopaedic departments of university, district and private hospitals in German-speaking regions of Europe. No patient information were included in this anonymised survey.

2.1. Statistical analyses

The online survey tool allowed for simple analyses, visualising frequencies and ratios. Further analyses and visualisations were performed using commercially available software (IBM SPSS Statistics Version 25, IBM Corp. Armonk, New York, USA).

3. Results

Between 22/10/2020 and 28/05/2021 81 orthopaedic surgeons completed the survey. The majority of participants were between 35 and 50 years old (49%, 40/81), male (77%, 62/81) and had completed their speciality training for full board certification (69%, 56/81), respectively. Correspondingly, the minority of surgeons were more than 50 years old (19%, 15/81) or younger than 35 years (32%, 26/81), female (23%, 19/81) and in speciality training (31%, 25/81), respectively.

The majority of participants were employed at university hospitals (58%, 47/81), followed by colleagues in district hospitals (26%, 21/81) and private hospitals (16%, 13/81). The most common orthopaedic subspecialties or fields of expertise among participants in declining order were general orthopaedics and traumatology (62%, 50/81), lower extremity (15%, 12/81), spinal surgery (12%, 10/81), upper extremity (6%, 5/81) and paediatric orthopaedic surgery (5%, 4/81).

3.1. Frequency of consulting the radiology report

Fig. 1 shows the numbers of orthopaedists consulting the radiology reports depending on imaging modality (conventional X-ray/plain radiograph, CT, MRI). 20% of participants voted to never read the report of an X-ray study, 4% would never consult a CT report and no one claimed to never consult the radiology report of an MRI study performed for one of her or his patients.

Among the 56 board certified orthopaedists, 35% (20/56) voted to routinely consult radiograph reports, 40% (22/56) only in case of personal uncertainty and 25% (14/56) would never read the radiology report. For CT examinations 38% (21/56) of fully trained orthopaedists would read the radiology report in case of personal uncertainty while 4% (2/56) would never look at the report. For MRI studies, 18% (10/56) of board certified orthopaedists would consult the radiology report only in cases of personal uncertainty.

Table 1
Questionnaire.

	Question	Response options
1	Age in years	<35 35–50 >50
2	Gender	Male Female
3	Level of training	Trainee including fellow Board certified consultant
4	Place of work	University hospital District hospital Private clinic
5	Subspecialty	General orthopaedics and traumatology Upper extremity Lower extremity Spinal surgery Paediatric surgery Miscellaneous – please specify
6	I read the conventional X-ray report of my patient	Always, completely Always, summary only Only in case of personal uncertainty Never
7	I read the CT report of my patient	Always, completely Always, summary only Only in case of personal uncertainty Never
8	I read the MRI report of my patient	Always, completely Always, summary only Only in case of personal uncertainty Never
9	Reason why I do not (always) read the radiology report (multiple choices possible)	Lack of time It takes too long until the reports become available No interest Lack of relevance Lack of trust in the report Report text too long Miscellaneous – please specify
10	My personal image assessment deviates from the radiology report	Always Often Sometimes Rarely Never
11	In case of discrepancies of image assessment and the radiology report I contact the radiologist	Always Often Sometimes Rarely Never
12	I appreciate active communication by the radiologist in case of unexpected or findings needed further work-up	Never, written report suffices Via telephone call Via email
13	In the final report I expect specific recommendations regarding imaging findings requiring further work-up	Yes, regarding the appropriate imaging modality Yes, regarding the time frame No
14	Recommendations to improve the radiology report	Shorter reports Faster availability of the written report More classifications in the report Less classifications in the report More angle and distance measurements Less angle and distance measurements More information regarding the presence or absence of non-musculoskeletal findings Significant images integrated in the report Miscellaneous (please specify)

3.2. Reasons for not consulting the radiology report

Fig. 2 summarizes the reasons why participants chose not to consult radiology reports. Time related reasons (duration to report availability

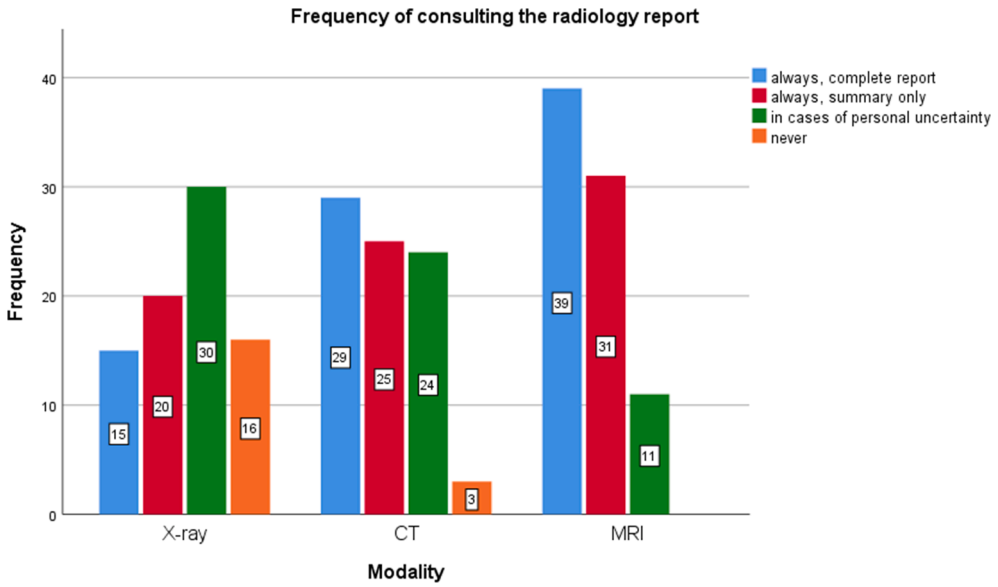

Fig. 1. Orthopaedist's frequency of consulting radiology reports depending on imaging modality.

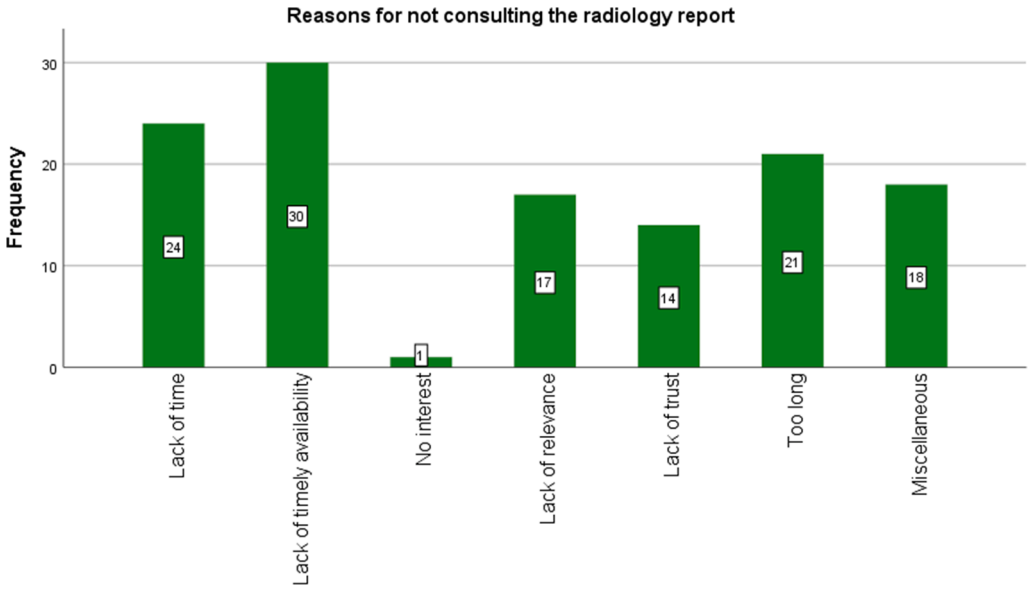

Fig. 2. Orthopaedist's reasons for not consulting radiology reports.

too long, lack of time, report text too long) were the most popular among the provided options, combining for 60% of all given answers. 22% of participants took the time to give specific (miscellaneous) answers in their own words. They reasoned, that orthopaedists need to assess the images themselves for patient consultations and surgery planning, voted to be more experienced than the reporting radiologists and criticized the lack of technical terms and false descriptions in the radiology reports. Two surgeons explicitly pointed out that they would consult the radiology report depending on the authorising radiologist.

3.3. Handling of discrepancies

Regarding interdisciplinary agreement, the majority of 62% (50/81) answered to disagree sometimes with the radiology report, while no one claimed to disagree always or never with the radiologist's opinion. 31% (25/81) disagreed rarely and 7% (6/81) often with the reports. All six participants who voted to often disagree with the radiologist had completed speciality training.

In case of discrepancy of opinion with the written report, 51% (41/81) of the participants would always (19%) or often (32%) contact the reporting radiologist, while the other 49% (40/81) would sometimes (30%) or rarely (19%) contact the radiologist. In case of unexpected findings requiring further workup 64% (52/81) preferred to be contacted directly via phone call, 33% (27/81) via email and 2% (2/81) regarded the written report as sufficient. Moreover, the large majority of 86% (70/81) expected a specific recommendation regarding the appropriate imaging modality for further work-up of these findings, while 7% (6/81) preferred not to have any recommendations in the reports.

3.4. Improvement recommendations

70 participants chose to give improvement recommendations. The answers are visualised in Fig. 3. The most popular response options for improvement of radiology reports were more rapid availability and the inclusion of significant images in the written reports, accounting for

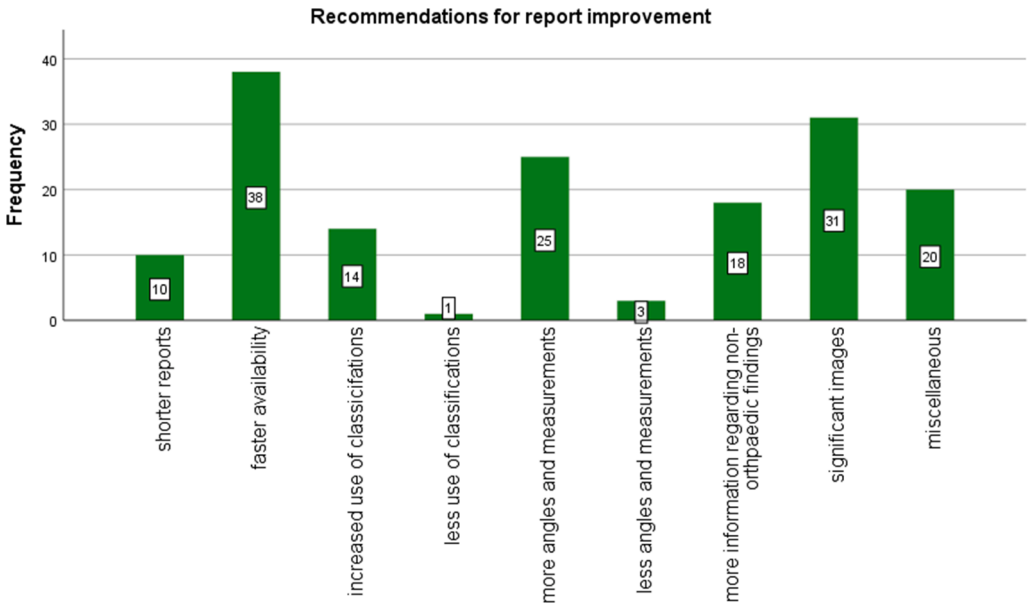

Fig. 3. Orthopaedist's recommendations for radiology report improvement.

24% and 19% among all responses, respectively.

29% (20/70) of participants took the opportunity to phrase specific comments and suggestions. Most criticism towards the radiology reports and call for improvement came with regard to the interpretation of joint prostheses, pointing out a lack of sufficient clinical and technical background knowledge. 30% (6/20) of the comments were proposing an increased level of direct interdisciplinary communication, advocating consultation with the referring physician in equivocal cases.

The impact of written reports, which lack clinical context, potentially causing patient confusion and insecurity was mentioned three times in an exhorting manner. One participant advocated care in interpretations beyond image morphology, especially conservative labelling of degenerative versus post-traumatic changes. One comment was directly relating to the question if orthopaedists read radiology reports. It said that orthopaedic surgeons must be competent in the interpretation of X-ray images regarding common orthopaedic pathologies. Moreover, the classification, relevance and therapy recommendation are subject to the surgeon's judgement with the patient's clinical presentation being of paramount importance for decision-making. Therefore, radiology reports often will not be consulted, as they have no implications for daily practice.

4. Discussion

This brief 14-question survey revealed that the majority of orthopaedic surgeons routinely consult radiology reports for most imaging studies. This contradicts the conception that this referrer group is only interested in the imaging data and not the radiologist's opinion. Reasons for not reading the report were mostly time related including late report availability, lengthy texts and a general lack of time to read the document. Most surgeons claimed to actively seek direct communication in cases of discrepant opinions and in turn appreciate a phone call, informing on unexpected imaging findings requiring further attention. Moreover, the survey conveyed a message of a general desire for increased interdisciplinary communication to solve equivocal cases and apply imaging interpretations in the appropriate clinical context.

As expected, participating orthopaedists consulted MRI reports more routinely than for radiographs and CTs. The questionable cost-effectiveness of dual-reading radiographs by orthopaedists and radiologists was frequently revisited in the literature. Studies showed no significant diagnostic difference between orthopaedists and radiologists [6,7] or superiority of the orthopaedist's assessment [8,9]. Conversely, in an earlier survey among 200 Australian and New Zealander orthopaedists, only 10% voted to consult X-ray reports [2]. In contrast, 43% of all participants and 35% of board-certified surgeons in our study voted to routinely consult radiograph reports. This suggests that radiological assessments play a larger role in our study group. Consequently, all imaging studies, including radiographs of the skeletal system, should be reviewed and reported carefully. This becomes more relevant as X-ray and CT reports are often consulted in cases of personal uncertainty, hence can provide immediate clinical support.

Lack of time has a significant effect on radiology report consultation and has previously been identified as a major factor interfering with effectiveness of the communication between radiologists and clinicians [10]. Most reasons for not consulting radiology reports in this study were time related. Accordingly, the majority of recommendations for radiology service improvement addressed the time issue as well, suggesting faster report turn-around times and shorter texts for improved reporting practice. Similarly, 63.5% among the Australian and New Zealander orthopaedists answered that radiograph reports were only sometimes available for consultation, highlighting the same issue [2]. The presented survey results revealed a desire towards an increased use of classification systems and angle measurements in radiology reports, which may contradict the call for shorter documents.

The majority of participating orthopaedic surgeons would welcome more interdisciplinary interaction with radiologists. This concerns the discussion of equivocal cases to come to a mutual, sensible conclusion in the appropriate clinical context as well as information on incidental findings requiring further work-up. A major concern expressed by the participants are reports, which lack imminent reference to the clinical context and can cause patient confusion and insecurity as the radiology report is an official document [11]. It needs to be noted, that reporting in correct clinical context necessitates a dedicated study question and clinical information on the radiology request form or in the hospital information system [12]. Nevertheless, cases with particular or equivocal background information, in addition to complex ones, should be discussed in mutual exchange between surgeon and radiologist. It was previously shown that direct in-person communication between radiologists and acute care surgeons significantly alters surgical decision making [13]. It can be hypothesised, that increased direct radiologist-orthopaedist communication will have positive impact on patient care as well. This exchange could be expanded with dedicated teaching

sessions and consensus on nomenclature to improve the use of appropriate terminology in reports and the technical background knowledge, e.g. in reporting of endoprostheses. Regular, short and dedicated interdisciplinary meetings could be held to monitor the effect of the aforementioned teaching sessions and reveal areas of improved consent and areas requiring further interdisciplinary discussion to improve mutual understanding.

There are several limitations to this study. Firstly, only 81 orthopaedic surgeons participated. Secondly, this survey was distributed in German-speaking parts of Europe. Findings could have limited applicability in other regions. Nevertheless, we believe that this survey revealed valuable suggestions from an important referrer group to improve musculoskeletal radiology practice in most institutions. Finally, it can be presumed that radiology reports differ across the included departments. Consequently, surgeons in some hospitals may consistently face reports including many classification systems and measurements while others do not. Despite this, we believe the findings give a general idea about the orthopaedist's preferences.

Concluding, this survey showed that orthopaedic surgeons routinely consult radiology reports. The participants expressed a desire for increased, direct interdisciplinary communication to solve equivocal cases and improve patient care.

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Disclosures

There are no disclosures.

CRediT authorship contribution statement

Ricardo Donners: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Andreas Gutzeit:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing - original draft, Writing - review & editing. **Julian E. Gehweiler:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Writing - review & editing. **Sebastian Manneck:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Validation, Writing - review & editing. **Balazs K. Kovacs:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing - review & editing. **Dorothee Harder:** Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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