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Guideline

The SCARE Statement: Consensus-based surgical case report guidelines

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HIGHLIGHTS

- CARE Guideline supports transparency and accuracy in publication of case-reports.
- However, the CARE guidelines are not tailored to surgery.
- Delphi-consensus exercise was used to develop **S**urgical **CA**se **RE**port (SCARE) Guidelines.
- Journals will be encouraged to endorse the SCARE guideline.

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ABSTRACT

Introduction: Case reports have been a long held tradition within the surgical literature. Reporting guidelines can improve transparency and reporting quality. However, recent consensus-based guidelines for case reports (CARE) are not surgically focused. Our objective was to develop surgical case report guidelines.

Methods: The CARE statement was used as the basis for a Delphi consensus. The Delphi questionnaire was administered via Google Forms and conducted using standard Delphi methodology. A multidisciplinary group of surgeons and others with expertise in the reporting of case reports were invited to participate. In round one, participants stated how each item of the CARE statement should be changed and what additional items were needed. Revised and additional items from round one were put forward into a further round, where participants voted on the extent of their agreement with each item, using a nine-point Likert scale, as proposed by the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) working group.

Results: In round one, there was a 64% (38/59) response rate. Following adjustment of the guideline with the incorporation of recommended changes, round two commenced and there was an 83% (49/59) response rate. All but one of the items were approved by the participants, with Likert scores 7–9 awarded by >70% of respondents. The final guideline consists of a 14-item checklist.

Conclusion: We present the SCARE Guideline, consisting of a 14-item checklist that will improve the reporting quality of surgical case reports.

1. Introduction

Medical case reports have been popular since the time of Hippocrates [1]. With the rise of evidence-based medicine (EBM) and their designation as level five evidence, their importance has decreased as focus has shifted to higher levels of evidence, such as

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randomised controlled trials (RCTs). Such studies minimize the bias inherent in looking at a single patient or even a case series, and are hence able to answer research questions with less inherent bias and more reliably – if conducted well. Some even feared the extinction of case reports due to low citation rates, negative effects on journal impact factor and restricted page budgets [2,3]. As a result, many journals have stopped publishing case reports altogether [2,4].

The rise of open access and electronic publishing has revived the humble case report, with the launch of new journals dedicated to publishing them [4]. In 2015, International Journal of Surgery (IJS) Case Reports (www.casereports.com) became the largest publisher of surgical case reports globally, according to Scopus® (www.scopus.com).

Vandenbrouke has discussed the contribution of case reports to medical progress: "*they permit discovery of new diseases and unexpected effects (adverse or beneficial) as well as the study of mechanisms, and they play an important role in medical education. Case reports and series have a high sensitivity for detecting novelty and therefore remain one of the cornerstones of medical progress; they provide many new ideas in medicine*".[5].

Case reports have specific relevance in the surgical literature. The IDEAL recommendations call for structured case reports for reporting a "first-in-man" study – i.e. the first time a new surgical technique is used, in stage 1 of their framework [6,7]. This has been exemplified in recent times by case reports of facial transplantation and other innovative techniques [8].

The Case Report or CARE Guidelines were developed in 2013 to provide a framework that supports transparency and accuracy in the publication of case reports and the reporting of information from patient encounters [9]. They have been adopted by multiple journals, and compliance with them has been mandatory at IJS Case Reports. However, they are not tailored to surgery. In the authors experience, the corollary is that peer-reviewers often focus on what's missing, rather than what's actually present within the manuscript. Our experience of over 3000 case reports informs us that surgical case reports have specific reporting requirements that need to be recognised in an adapted reporting guideline based on CARE. The objective of this research was to conduct a Delphi consensus exercise among experienced case report reviewers and editors to develop the **S**urgical **CA**se **RE**port (SCARE) Guidelines.

1.1. Developing the SCARE guideline

We published our research protocol in advance [10]. In summary, we used the existing CARE guidelines as a starting point, together with the Delphi consensus exercise approach. We issued a survey using Google Forms (https://www.google.co.uk/forms/about) asking participants in round one how each item of the CARE guidelines should be changed, and gave an opportunity to provide free text feedback. Following analysis of this information from round one, the 13 items of the CARE guidelines were adjusted as indicated by the participants.

In a subsequent round, participants were asked to rate their level of agreement with the revised item and any additional items that were suggested using a nine-point Likert scale and methodology as proposed by the GRADE group [11,12]. In this scale 1 to 3 signifies an outcome of limited importance, 4 to 6 important but not critical, and 7 to 9 critical. If 70% or more of respondents scored an item 7 to 9 and fewer than 15% scored it 1 to 3, that item proceeded into the reporting guideline. Similarly, consensus that an outcome should not be included was 70% or more scoring it 1 to 3 and 15% or less scoring it 7 to 9. The entire process was conducted electronically and there were no pre-determined number of Delphi rounds.

1.2. Participant selection

Surgeons and others with significant experience in reviewing or editing case reports were selected. They were drawn from the reviewer pool of IJS Case Reports (the top 150 were invited) as well as those who have written on the topic of case reports or case series in the past or who were recommended by Professor Douglas Altman – who pioneered the CONSORT guideline. In total, 59 participants agreed to the invitation to participate in this study, representing 21 countries and all ten surgical specialties as well as allied specialties including; dermatology, pathology, oncology, clinical pharmacology, acute care surgery, with many participants also occupying positions on journal editorial boards [13].

2. Results

A pilot study was conducted prior to round one to check the participants understanding of the questions. This involved 15/59 (25%) participants completing the survey before it went out to the remainder of the group. The only change made following this was to include a field for name, so that the author could see who actually completed the survey and therefore who needed to be reminded. There was no evidence of misinterpretation or confusion with the survey. In round one, there was a 64% (38/59) response rate. The consensus view together with participant responses are integrated into Table 1.

Following adjustment of the guideline with incorporation of recommended changes, round two commenced. There was an 83% (49/59) response rate. All items were approved by the participants with Likert scores 7–9 awarded by >70% of respondents, apart from item 12, which had 63%. Given that this is in the original guideline and is optional i.e. "*when appropriate*", it has carried over to the SCARE guideline.

2.1. SCARE guideline

Table 2 constitutes the SCARE guideline, and this is provided again in an appendix, together with a column in which the author can state the page number on which the criterion was achieved. All authors submitting surgical case reports should also submit a completed SCARE checklist with their manuscript and also state explicitly in their report that they have complied with the SCARE guideline, which they can cite. The guideline represents the minimum that should be reported, and authors are encouraged to provide additional details they deem relevant to the understanding of the case.

2.2. Endorsement

The SCARE guideline has been endorsed by the IJS Case Reports, which publishes more surgical case reports than any other journal according to the SCOPUS® abstracting and indexing service. It has also been endorsed by Annals of Medicine and Surgery and IJS Open, IJS Oncology, and IJS Short Reports (all part of IJS Publishing Group Ltd) as well as Annals of Vascular Surgery. The authors hope that more journals will endorse the guideline in due course.

Table 1
CARE Guidelines and round one responses.

Topic	Item	Checklist item description	Responses ($n = 38$)
Title	**1**	The words "case report" should be in the title along with the area of focus	No Change 92% (35/38)
Key Words	**2**	2 to 5 key words that identify areas covered in this case report	No Change 87% (33/38)
Abstract	**3a**	Introduction—What is unique about this case? What does it add to the medical literature?	No Change 92% (35/38)
	3b	The main symptoms of the patient and the important clinical findings	
	3c	The main diagnoses, therapeutic interventions, and outcomes	
	3d	Conclusion—What are the main "take-away" lessons from this case?	
Introduction	**4**	One or two "Paragraphs" summarizing why this case is unique or educational, with references	No Change 89% (34/38)
Patient Information	**5a**	De-identified demographic information and other patient specific information	No major change 92% (35/38) but specifically add patient age, sex, ethnicity, occupation and hand dominance if relevant.
	5b	Main concerns and symptoms of the patient	
	5c	Medical, family, and psychosocial history including relevant genetic information (also see timeline)	Add drug history.
	5d	Relevant past interventions and their outcomes	
Clinical Findings	**6**	Describe the relevant physical examination (PE) and other significant clinical findings	No Change 89% (34/38)
Timeline	**7**	Important information from the patient's history organized as a timeline	No Change 79% (30/38) "No need for timeline" "delay from presentation to surgery should be reported"
Diagnostic Assessment	**8a**	Diagnostic methods (such as PE, laboratory testing, imaging, surveys)	No Change 89% (34/38)
	8b	Diagnostic challenges (such as access, financial, or cultural)	Spell out "PE" (i.e. physical exam). Add histopathology and radiological images.
	8c	Diagnostic reasoning including other diagnoses considered	
	8d	Prognostic characteristics (such as staging in oncology) where applicable	
Therapeutic Intervention	**9a**	Types of intervention (such as pharmacologic, surgical, preventive, self-care)	Changes 53% (20/38) "What time periods"
	9b	Administration of intervention (such as dosage, strength, duration)	"Postoperative surgical stay."
	9c	Changes in intervention (with rationale)	"Need to stress patient reported outcome measures" "Describe concurrent treatments (antibiotics, analgesics, nill-per-os, etc.)" "What was done, when it was done, and how it was done. Focus on the decision making process in case of intervention" "Surgical technique and used materials" "1. particular surgical tools or need for equipment 2. the level of difficulty of the surgery, 3. anticipated learning curve, 4. similarity to other procedures (may be too obvious to be worth mentioning). 5. For e.g. (cutaneous) laser surgery dosing, i.e. number of treatments and settings of the laser, information that informs the setting e.g. skin type 6. anticipated complications and caution 7. backup teams, can it be done ambulatory? 8. information about post surgery care, post surgery disability, specialty needs, and special wound care needs facilitate replication" "Types of intervention (non-operative, operative, minimally invasive, endovascular, endoscopic, preventive)" "Why was that specific operation chosen? Is it an innovative operation? (Explain rationale and peculiar technical aspects). Are new devices used? (Describe them). Were there any unexpected outcomes?(Unpredicted histology,very rare intraoperative surgical complications)."
Follow-up and Outcomes	**10a**	Clinician and patient-assessed outcomes (when appropriate)	Changes 71% (27/38)
	10b	Important follow-up diagnostic and other test results	"Future surveillance requirements - e.g. EVAR"
	10c	Intervention adherence and tolerability (How was this assessed?)	"Some items like blood loss, operative time, wound complications, re-exploration/revision surgery, 30-day post-op morbidity may need to be specified."
	10d	Adverse and unanticipated events	"How were complications prevented, diagnosed and managed."
Discussion	**11a**	Discussion of the strengths and limitations in your approach to this case	No change 87% (33/38)
	11b	Discussion of the relevant medical literature	"Contraindications for the procedure"
	11c	The rationale for conclusions (including assessment of possible causes	"Any new hypothesis generating findings?"
	11d	The primary "take-away" lessons of this case report	"Potential patient risk and possible complication if new description of surgical technique or implant."
Patient Perspective	**12**	When appropriate the patient should share their perspective on the treatments they received	No change 89% (34/38)
Informed Consent	**13**	Did the patient give informed consent? Please provide if requested	No change 97% (37/38)
Additional items		Acknowledgement section; competing interests; ethics committee or institutional review board approval where appropriate. The setting in which the case was done: academic, community or private practice setting? Limitations of the case report Patient optimization pre-op	Changes 47% (18/38) but no comments specifically given.

Table 1 (*continued*)

Topic	Item	Checklist item description	Responses ($n = 38$)
		Any radiological figures or pathological sections, intraoperative findings photos, endoscopic images.	

Table 2
Delphi Round two responses – items included here constitute the final SCARE guideline.

Topic	Item	Checklist item description	$n = 49$, scores 7-9
Title	**1**	The words "case report" and the area of focus should appear in the title (e.g. presentation, diagnosis, surgical technique or device or outcome)	94% (46/49)
Key Words	**2**	3 to 6 key words that identify areas covered in this case report (include "case report" as one of the keywords)	78% (38/49)
Abstract	**3a**	Introduction—What is unique or educational about the case? What does it add to the surgical literature? Why is this important?	98% (48/49)
	3b	The patient's main concerns and important clinical findings.	
	3c	The main diagnoses, therapeutic interventions, and outcomes.	
	3d	Conclusion — what are the "take-away" lessons from this case?	
Introduction	**4**	A summary of why this case is unique or educational with reference to the relevant surgical literature and current standards of care (with references, 1–2 paragraphs). Nature of the institution in which the patient was managed; academic, community or private practice setting?	88% (43/49)
Patient Information	**5a**	De-identified demographic and other patient specific information including age, sex, ethnicity, occupation and other useful pertinent information e.g. BMI and hand dominance.	90% (44/49)
	5b	Presentation, including presenting complaint and symptoms of the patient as well as the mode of presentation e.g. brought in by ambulance or walked into Emergency Room or referred by family physician.	
	5c	Past medical and surgical history and relevant outcomes from interventions	
	5d	Drug history, family history, including any relevant genetic information, and psychosocial history, including smoking status and where relevant accommodation type, walking aids, etc.	
Clinical Findings	**6**	Describe the relevant physical examination and other significant clinical findings (include clinical photographs where relevant and where consent has been given).	98% (48/49)
Timeline	**7**	Inclusion of data which allows readers to establish the sequence and order of events in the patient's history and presentation (using a table or figure if this helps). Delay from presentation to intervention should be reported.	90% (44/49)
Diagnostic Assessment	**8a**	Diagnostic methods (physical exam, laboratory testing, radiological imaging, histopathology etc).	94% (46/49)
	8b	Diagnostic challenges (access, financial, cultural).	
	8c	Diagnostic reasoning including other diagnoses considered	
	8d	Prognostic characteristics when applicable (e.g. tumour staging). Include relevant radiological or histopathological images in this section (the latter may sometimes be better placed in section 9).	
Therapeutic Intervention	**9a**	Pre-intervention considerations e.g. Patient optimisation: measures taken prior to surgery or other intervention e.g. treating hypothermia/hypovolaemia/hypotension in a burns patient, ICU care for sepsis, dealing with anticoagulation/other medications, etc	92% (45/49)
	9b	Types of intervention(s) deployed and reasoning behind treatment offered (pharmacological, surgical, physiotherapy, psychological, preventive) and concurrent treatments (antibiotics, analgesia, anti-emetics, nil by mouth, VTE prophylaxis, etc). Medical devices should have manufacturer and model specifically mentioned.	
	9c	Peri-intervention considerations - administration of intervention (what, where, when and how was it done, including for surgery; anaesthesia, patient position, use of tourniquet and other relevant equipment, prep used, sutures, devices, surgical stage (1 or 2 stage, etc). Pharmacological therapies should include formulation, dosage, strength, route, duration.	
	9d	Who performed the procedure - operator experience (position on the learning curve for the technique if established, specialisation and prior relevant training).	
	9e	Any changes in the interventions with rationale. Include intra-operative photographs and/or video or relevant histopathology in this section. Degree of novelty for a surgical technique/device should be mentioned e.g. "first in-human".	
	9f	Post-intervention considerations e.g. post-operative instructions and place of care.	
Follow-up and Outcomes	**10a**	Clinician assessed and patient-reported outcomes (when appropriate) should be stated with inclusion of the time periods at which assessed. Relevant photographs/radiological images should provided e.g. 12 month follow-up.	94% (46/49)
	10b	Important follow-up measures - diagnostic and other test results. Future surveillance requirements - e.g. imaging surveillance of endovascular aneurysm repair (EVAR) or clinical exam/ultrasound of regional lymph nodes for skin cancer.	
	10c	Where relevant - intervention adherence and tolerability (how was this assessed).	
	10d	Complications and adverse or unanticipated events. Described in detail and ideally categorised in accordance with the Clavien-Dindo Classification. How they were prevented, diagnosed and managed. Blood loss, operative time, wound complications, re-exploration/revision surgery, 30-day post-op and long-term morbidity/mortality may need to be specified.	
Discussion	**11a**	Strengths, weaknesses and limitations in your approach to this case. For new techniques or implants - contraindications and alternatives, potential risks and possible complications if	98% (48/49)

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Table 2 (*continued*)

Topic	Item	Checklist item description	$n = 49$, scores 7-9
		applied to a larger population. If relevant, has the case been reported to the relevant national agency or pharmaceutical or devices company (e.g. an adverse reaction to a device).	
	11b	Discussion of the relevant literature, implications for clinical practice guidelines and any relevant hypothesis generation.	
	11c	The rationale for your conclusions.	
11d		The primary "take-away" lessons from this case report.	
Patient Perspective	**12**	When appropriate the patient should share their perspective on the treatments they received.	63% (31/49)
Informed Consent	**13**	Did the patient give informed consent for publication? Please provide if requested by the journal/editor. If not given by the patient, explain why e.g. death of patient and consent provided by next of kin or if patient/family untraceable then document efforts to trace them and who within the hospital is acting as a guarantor of the case report.	80% (39/49)
Additional Information	**14**	Conflicts of Interest, sources of funding, institutional review board or ethics committee approval where required/appropriate.	84% (41/49)

3. Conclusion

The SCARE Statement is a consensus-based guideline following two Delphi rounds among a multidisciplinary and expert group in the area of surgery and case reports. We hope that surgeons and surgical journals will adopt them. We look forward to feedback from the community as well as studies of its implementation to help inform any future revision of these guidelines.

Ethical approval

Not applicable

Sources of funding

None declared.

Author contribution

Riaz A Agha: Concept and design of study, data collection, data interpretation and analysis, drafting, revision, approval of final manuscript

Alexander J Fowler: Data collection, revision, approval of final manuscript

Alexandra Saeta: Data collection, revision, approval of final manuscript

Ishani Barai: Data collection, revision, approval of final manuscript

Shivanchan Rajmohan: Data collection, revision, approval of final manuscript

Dennis P Orgill: Design of study, revision, approval of final manuscript

Conflicts of interest

None declared. The authors have no financial, consultative, institutional, and other relationships that might lead to bias or conflict of interest

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Not applicable

Guarantor

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Appendix

SCARE Checklist

Topic	Item	Checklist item description	Page Number
Title	**1**	The words "case report" and the area of focus should appear in the title (e.g. presentation, diagnosis, surgical technique or device or outcome).	
Key Words	**2**	3 to 6 key words that identify areas covered in this case report (include "case report" as one of the keywords).	
Abstract	**3a**	Introduction—What is unique or educational about the case? What does it add to the surgical literature? Why is this important?	
	3b	The patient's main concerns and important clinical findings.	
	3c	The main diagnoses, therapeutics interventions, and outcomes.	
	3d	Conclusion — what are the "take-away" lessons from this case?	
Introduction	**4**	A summary of why this case is unique or educational with reference to the relevant surgical literature and current standard of care (with references, 1-2 paragraphs). Nature of the institution in which the patient was managed; academic, community or private practice setting?	
Patient Information	**5a**	De-identified demographic and other patient specific information including age, sex, ethnicity, occupation and other useful pertinent information e.g. BMI and hand dominance.	
	5b	Presentation including presenting complaint and symptoms of the patient as well as the mode of presentation e.g. brought in by ambulance or walked into Emergency Room or referred by family physician.	
	5c	Past medical and surgical history and relevant outcomes from interventions	
	5d	Drug history, family history, including any relevant genetic information, and psychosocial history, including smoking status and where relevant accommodation type, walking aids, etc.	
Clinical Findings	**6**	Describe the relevant physical examination and other significant clinical findings (include clinical photographs where relevant and where consent has been given).	
Timeline	**7**	Inclusion of data which allow readers to establish the sequence and order of events in the patient's history and presentation (using a table or figure if this helps). Delay from presentation to intervention should be reported.	
Diagnostic Assessment	**8a**	Diagnostic methods (physical exam, laboratory testing, radiological imaging, histopathology etc).	
	8b	Diagnostic challenges (access, financial, cultural).	
	8c	Diagnostic reasoning including other diagnoses considered	
	8d	Prognostic characteristics when applicable (e.g. tumour staging). Include relevant radiological or histopathological images in this section (the latter may sometimes be better placed in section 9).	
Therapeutic Intervention	**9a**	Pre-intervention considerations e.g. Patient optimisation: measures taken prior to surgery or other intervention e.g. treating hypothermia/hypovolaemia/ hypotension in a burns patient, ICU care for sepsis, dealing with anticoagulation/ other medications, etc	
	9b	Types of intervention(s) deployed and reasoning behind treatment offered (pharmacological, surgical, physiotherapy, psychological, preventive) and concurrent treatments (antibiotics, analgesia, anti-emetics, nil by mouth, VTE prophylaxis, etc). Medical devices should have manufacturer and model specifically mentioned.	
	9c	Peri-intervention considerations - administration of intervention (what, where, when and how was it done, including for surgery; anaesthesia, patient position, use of tourniquet and other relevant equipment, prep used, sutures, devices, surgical stage (1 or 2 stage, etc). Pharmacological therapies should include formulation, dosage, strength, route, duration, etc).	
	9d	Who performed the procedure - operator experience (position on the learning curve for the technique if established, specialisation and prior relevant training).	
	9e	Any changes in the interventions with rationale. Include intra-operative photographs and/or video or relevant histopathology in this section. Degree of novelty for a surgical technique/device should be mentioned e.g. "first in-human".	
	9f	Post-intervention considerations e.g. post-operative instructions and place of care.	
Follow-up and Outcomes	**10a**	Clinician assessed and patient-reported outcomes (when appropriate) should be stated with inclusion of the time periods at which assessed. Relevant photographs/radiological images should provided e.g. 12 month follow-up.	
	10b	Important follow-up measures - diagnostic and other test results. Future surveillance requirements - e.g. imaging surveillance of endovascular aneurysm repair (EVAR) or clinical exam/ultrasound of regional lymph nodes for skin cancer.	
	10c	Where relevant - intervention adherence and tolerability (how was this assessed).	

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SCARE Checklist			
Topic	Item	Checklist item description	Page Number
	10d	Complications and adverse or unanticipated events. Described in detail and ideally categorised in accordance with the Clavien-Dindo Classification. How they were prevented, diagnosed and managed. Blood loss, operative time, wound complications, re-exploration/revision surgery, 30-day post-op and long-term morbidity/mortality may need to be specified.	
Discussion	**11a**	Strengths, weaknesses and limitations in your approach to this case. For new techniques or implants - contraindications and alternatives, potential risks and possible complications if applied to a larger population. If relevant, has the case been reported to the relevant national agency or pharmaceutical company (e.g. an adverse reaction to a device).	
	11b	Discussion of the relevant literature, implications for clinical practice guidelines and any relevant hypothesis generation.	
	11c	The rationale for your conclusions.	
	11d	The primary "take-away" lessons from this case report.	
Patient Perspective	**12**	When appropriate the patient should share their perspective on the treatments they received.	
Informed Consent	**13**	Did the patient give informed consent for publication? Please provide if requested by the journal/editor. If not given by the patient, explain why e.g. death of patient and consent provided by next of kin or if patient/family untraceable then document efforts to trace them and who within the hospital is acting as a guarantor of the case report.	
Additional Information	**14**	Conflicts of Interest, sources of funding, institutional review board or ethical committee approval where required.	

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