SUPER
Surgical techniQue rePorting chEcklist and standaRds

Surgical techniQue rePorting chEcklist and standaRds (SUPER)

Section/Topic	Item No	Recommendation	Reported on Page Number/Line Number	Reported on Section/Paragraph
Background, Rationale, and Objectives				
Background	1	Describe the background of the disease or condition (e.g., its definition, classification, clinical manifestations, epidemiological characteristics, and natural history).		
Rationale	2a	Describe the pros and cons of existing treatments for the disease or condition, including currently used single or combined surgical techniques.		
	2b	Explain whether the proposed surgical technique is a novel or modified procedure, including whether any modifications have been made to key devices or materials. If only a conventional surgical technique is used, a brief description should be accompanied by a citation of a source which describes the surgical technique in detail.		
Objectives	3	State what objectives and challenges the proposed surgical technique will address. Introduce what the surgical technique figure and video will cover.		
Classification	4	Classify the surgical technique, either by: (i) surgical approach: open, minimally invasive (e.g., thoracoscopic, robotic), or hybrid; or (ii) treatment goal: curative or palliative.		
Name	5	Report the names of all involved surgical techniques in the title or abstract. If the surgical technique is the focus of the paper, also include “surgical technique” in the title.		
Preoperative Preparations and Requirements				
Setting	6a	Report information or requirements of the surgical environment (e.g., the name of the hospital, the hospital grade such as tertiary hospital, the degree of cleanliness, and whether the procedure must be performed in an operating theatre).		
	6b	List and provide details of any special surgical equipment, supplies, drugs, or software used (e.g., the manufacturer, product model, quantity, dosage, route, duration, and parameters).		
Operators	7	Provide information about the surgical team personnel, including their role (e.g., surgeon, anesthetist, nurse), learning curve (e.g., the number of cases), and training needed if applicable.		

Recipients	8	Report detailed indications and contraindications. (i) Disease or condition: type, etiology, the location, shape and size of the lesion, etc. (ii) Recipients: age, sex, clinical manifestations, disease stage and severity, comorbidities and related complications, surgical history and relevant family history, preoperative tests, pre-intervention, and other factors pertinent to successful practice.		
	9	Provide detailed generic information and preparations. (i) Generic information: de-identified demographic information, symptoms and signs, imaging findings, staging, comorbidities, and relevant therapy history, etc. (ii) Preparations: cardiovascular, gastrointestinal and respiratory tract preparation, urinary catheterization, skin preparation, blood product preparation, anesthetic procedure and management, and patient positioning, etc.		
Surgical Technique Details				
Surgical approach, key anatomic landmarks, and adjacent structures	10a	Describe in detail how to establish the surgical approach (e.g., devices and equipment used, the position of the surgeons, anatomic localization, and the incision type, length, size, depth, angle, and number).		
	10b	Describe the essential anatomic landmarks and adjacent structures, including areas, structures, blood vessels, and nerves, etc. (e.g., “use the Louis angle between the sternal manubrium and the sternal body to find the second costal notch”).		
Intraoperative monitoring	11	Describe intraoperative monitoring specifically related to the surgical technique (e.g., near-infrared spectroscopy in aortic arch surgery).		
Step-by-step description	Include all relevant details of each operative step in a step-by-step manner along with both quantitative and qualitative description.			
	12a	Details may include the intraoperative findings, timeline, histomorphology, exposure of vital structures, extent of lymph node dissection, determination of surgical margins, suture pattern (running suture or single stitches; spacing of stitches), anastomosis, knot-tying, specimen handling, and devices/supplies/drugs/blood products used, etc.		
	12b	Note the operative time.		
	12c	If a non-conventional maneuver was applied, specify the reason.		
Quality and consistency	13	Describe tips and skills for ensuring surgical quality and consistency, especially for the key steps and any conditions or variations that require uniform management (if applicable). For example, using standardized training, establishing quality control teams, and organizing multidisciplinary consultations.		

Safety	14	Describe tips and skills for ensuring safety. For example, how to prevent or deal with possible intraoperative complications and emergencies, or when and how to undertake a surgical conversion.		
Visualization	15a	Visualize the key steps in a step-by-step and self-explanatory manner. Consider using narrated video(s) and anatomic illustration(s) with designated symbols and illustrated text.		
	15b	The key information in item 12 should be visualized; it can either be presented as a stand-alone figure or embedded in the video(s).		
	15c	Visualization of the key information in items 10, 13, and 14 is encouraged as appropriate.		
	15d	After peer review, add clips into the video(s) to present the video title, operator name, and operation date at the beginning, and the informed consent and the ethical approval statements at the end.		
Postoperative Considerations and Tasks				
Evaluation	16a	Define the criteria for success and failure, and evaluate the efficacy or effectiveness of the surgical technique from both the technical aspect and the clinical outcome perspective (e.g., length of stay, improvements in short- and long-term mortality, recurrence, survival time, and patient impairment).		
	16b	When possible, include the perspective of the patient (e.g., symptoms and signs, postoperative pain, and aesthetic results).		
Postoperative monitoring	17	Describe in detail postoperative monitoring specifically related to the surgical technique (e.g., monitoring indicators, devices, frequency or duration, examination, and nursing required).		
Complication prevention and management	18	Report the possible or observed postoperative complications and their prevention and management, especially complications that differ from those related to conventional techniques.		
Follow-up	19a	Report the details of follow-up visits, including pathway, frequency, duration, and indicators (e.g., pathway-”telephone follow-up”; frequency-”radiological examinations every 3 months”; duration-”up to 3 years”; indicators-poor outcomes, complications, quality of life, and unexpected events).		
	19b	If applicable, compare the information in item 19a with those of conventional techniques.		
Summary and Prospect				
Strengths, limitations, and outlook	20	Discuss the main strengths and limitations of the surgical technique, and provide detailed suggestions for improvement and future outlooks.		
Impact and cost	21a	Summarize the key points and take-away lessons of the surgical technique and its impact in the clinical setting and on society (e.g., the economic cost).		
	21b	Consider in context the predominant cost and its potential impact on the implementation and adoption of the surgical technique.		

Other Information				
Conflicts of interest, ethical approval, and informed consent	22	(i) Specify any potential conflicts of interest; (ii) include the ethics committee or institutional review board approval (and the number when applicable); and (iii) provide the informed consent for publication.		

SUPER website: https://www.thesuper.org/

Zhang K, Ma Y, Wu J, Shi Q, Barchi L, Scarci M, et al. The SUPER reporting guideline suggested for reporting of surgical technique. Hepatobiliary Surg Nutr 2023. doi: 10.21037/hbsn-22-509

Zhang K, Ma Y, Shi Q, Wu J, Shen J, He Y, et al. Developing the surgical technique reporting checklist and standards: a study protocol. Gland Surg 2021;10(8): 2591-2599.

STROBE Statement—checklist of items that should be included in reports of observational studies

Section/item	Item No	Recommendation	Reported on Page Number/Line Number	Reported on Section/Paragraph
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract		
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found		
Introduction				
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported		
Objectives	3	State specific objectives, including any prespecified hypotheses		
Methods				
Study design	4	Present key elements of study design early in the paper		
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection		
Participants	6	(a) ***Cohort study***—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up ***Case-control study***—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls ***Cross-sectional study***—Give the eligibility criteria, and the sources and methods of selection of participants		
		(b) ***Cohort study***—For matched studies, give matching criteria and number of exposed and unexposed ***Case-control study***—For matched studies, give matching criteria and the number of controls per case		
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable		
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group		
Bias	9	Describe any efforts to address potential sources of bias		
Study size	10	Explain how the study size was arrived at		
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why		

Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding		
		(b) Describe any methods used to examine subgroups and interactions		
		(c) Explain how missing data were addressed		
		(d) ***Cohort study***—If applicable, explain how loss to follow-up was addressed ***Case-control study***—If applicable, explain how matching of cases and controls was addressed ***Cross-sectional study***—If applicable, describe analytical methods taking account of sampling strategy		
		(e) Describe any sensitivity analyses		
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed		
		(b) Give reasons for non-participation at each stage		
		(c) Consider use of a flow diagram		
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders		
		(b) Indicate number of participants with missing data for each variable of interest		
		(c) ***Cohort study***—Summarise follow-up time (eg, average and total amount)		
Outcome data	15*	***Cohort study***—Report numbers of outcome events or summary measures over time		
		Case-control study—Report numbers in each exposure category, or summary measures of exposure		
		Cross-sectional study—Report numbers of outcome events or summary measures		
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included		
		(b) Report category boundaries when continuous variables were categorized		
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period		
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses		
Discussion				
Key results	18	Summarise key results with reference to study objectives		
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias		

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence		
Generalisability	21	Discuss the generalisability (external validity) of the study results		
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based		

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.