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Selective non-operative management of abdominal gunshot wounds: Survey of practise

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ABSTRACT

Background: There is a growing body of evidence attesting to the effectiveness and safety of selective non-operative management (SNOM) of abdominal gunshot wounds. However, much of the research which supports this conclusion has originated from a few centres, and the actual utilisation of SNOM by trauma surgeons is not known. We therefore conducted a survey to assess the acceptance of this strategy and evaluate variations in practise.

Methods: Electronic questionnaire survey of trauma surgeons in the United States of America, Canada, Brazil, and South Africa. Responses were compared using Chi^2 and Fisher's exact tests.

Results: 183 replies were received. 105 (57%) respondents practise SNOM of abdominal gunshot wounds, but there are marked regional variations in the acceptance of this strategy ($p < 0.01$). Respondents who had completed trauma ($p < 0.01$) or critical care ($p < 0.01$) fellowships, and those who practise in a higher volume centre (defined as >50 penetrating abdominal injuries seen per year) ($p < 0.01$) are more likely to practise SNOM of gunshot wounds.

Most surgeons who practise SNOM regard peritonitis, omental and bowel evisceration, and being unable to evaluate a patient as a contraindication to attempting non-operative management. Almost all regard CT as essential. Respondents' preparedness to consider SNOM is related to injury extent.

Conclusions: SNOM of abdominal gunshot wounds is practised by trauma surgeons in all four countries surveyed, but is not universally accepted, and there are variations in how it is practised.

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Introduction

The management of penetrating abdominal trauma has come full circle. Through the 19th and first part of the 20th century, virtually all penetrating abdominal injuries were managed expectantly, as exploration was associated with prohibitive mortality.[1] During the first World War, large numbers of casualties with penetrating injuries, together with increasing experience of operative and perioperative management, led to a reversal of this strategy.[1] Mandatory exploration became the standard of care, and remained so until the 1960s, when it was recognised that many stab wounds were not associated with intra-abdominal injury or even peritoneal violation.[2] The selective non-operative management of abdominal stab wounds is now widely practised. Over the past two decades, the increased availability and quality of cross-sectional imaging has led to an extension of selective non-operative management to the treatment of ballistic injuries, and there is increasing evidence that this approach is both safe and effective.[3–14] However, much of the research which supports this conclusion has originated from a few centres in the United States and South Africa, and has been criticised for its applicability and lack of generalisability.

The impetus for a more discerning approach has come from the recognition that between one-third and two-thirds of laparotomies for abdominal gunshot wounds are non-therapeutic: a prospective series of 309 patients with anterior abdominal gunshot

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wounds has shown that 30% could be managed non-operatively, and a further prospective study of 203 patients with gunshot wounds to the back has shown that 69% did not have clinically significant injuries.[4,15,16] A retrospective, combined series of almost 2000 anterior and posterior abdominal gunshot wounds has similarly shown that 47% had no clinically significant injuries.[10] Non-therapeutic intervention is, furthermore, not benign: complications occur in 9–26% of non-therapeutic laparotomies, and 20% of patients without peritoneal violation.[17–19]

The Eastern Association for the Surgery of Trauma recently published guidelines which endorse the selective management of abdominal gunshot wounds, signalling a welcome paradigm shift in practise.[20] However, clinical guidelines – which are often drawn up by enthusiasts and subject matter experts – do not always reflect mainstream practise. The acceptance of selective non-operative management by trauma surgeons "at the coalface" is not known. We therefore conducted a survey to assess the acceptance of this strategy, evaluate regional variations in practise, and determine whether trauma surgeons' training, professional setting and penetrating trauma workload influence the likelihood of their utilisation of selective non-operative management.

We have previously reported a related study, comparing the utilisation of selective non-operative management of penetrating trauma by British and Irish general surgeons, with trauma surgeons in the United States.[21] Trauma is not recognised as a general surgical subspecialty in Britain, and remains the responsibility of the general surgeon. The survey showed that, although the management of stab wounds approximates to the care provided by trauma surgeons in the US, very few British and Irish general surgeons practise selective management of ballistic injuries.

Materials and methods

Electronic questionnaire survey of trauma surgeons in the United States of America, Canada, Brazil, and South Africa, conducted between September and November 2010. The survey contained questions on respondents' demographics, their opinion on the evidence for selective non-operative management, as well as their views on contraindications and investigations required. The questionnaire also contained a series of clinical management scenarios, to determine which types of injuries respondents felt appropriate to manage non-operatively. The survey was designed by the authors, piloted, and approved by the Multi-Institutional Trials Committee of the American Association for the Surgery of Trauma, the Trauma Association of Canada and the Association of Surgeons of Great Britain and Ireland. It was electronically distributed, using surveymonkey™ (www.surveymonkey.com), to members of the American Association for the Surgery of Trauma, Trauma Association of Canada, Sociedade Brasileira de Atendimento Integrado ao Traumatizado, and trauma surgeons in South Africa. The results were collated using Microsoft® Excel® and analyzed with SPSS® (IBM®, USA). Proportions were compared using Chi^2 and Fisher's exact tests (for 2×2 tables, when assumptions for Chi^2 testing were not met). No adjustments were made for multiple comparisons. An alpha of 0.05 was deemed statistically significant.

Results

183 responses were received: nine (5%) from South Africa, 58 (32%) from Brazil, 30 (16%) from Canada, and 86 (47%) from the United States. The majority of respondents (85%) declared a major or exclusive interest in trauma surgery. 62% also declared a major or exclusive interest in critical care medicine. The number of surgeons from the United States who responded represents approximately 7% of the AAST membership, and the number of surgeons from Brazil who responded represents 18% of the SBAIT membership. It is not possible to calculate similar response rates for Canada, as the Trauma Association of Canada membership also includes other professions, and South Africa, as the denominator of "total number of trauma surgeons" in these countries is not known. 84% of respondents from the United States, Canada, and South Africa practise in a level 1 trauma centre or equivalent. This information is not available for Brazil, which does not have a system for the stratification or verification of trauma centres. Six out of ten respondents practise in a centre which sees less than 50 penetrating abdominal injuries per year. Three-quarters of respondents had completed a trauma surgery fellowship and half had completed a critical care medicine fellowship.

Acceptance

76% of respondents agreed that the treatment of penetrating abdominal injury is moving towards selective non-operative management (Fig. 1). Approximately equal proportions of respondents agreed and disagreed with the statement that selective non-operative management is an effective and safe way to care for a patient with an abdominal gunshot wound (Fig. 2). More than half of respondents felt that further research is required before they would feel comfortable treating patients with abdominal gunshot wounds non-operatively (Fig. 3).

57% of respondents practise selective management of abdominal gunshot wounds, but there are marked regional variations in the acceptance of this strategy, ranging from 30% in Canada to 71%

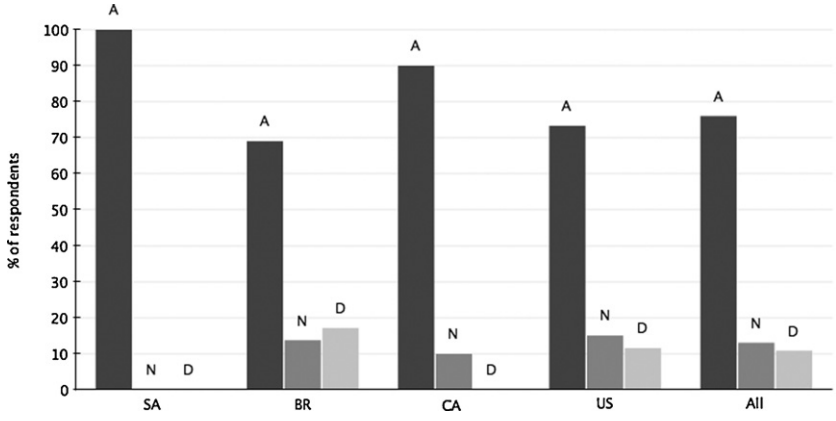

Fig. 1. Respondents' agreement with the statement "The treatment of penetrating abdominal injuries is moving towards selective non-operative management", by country of practise (A, agree/strongly agree; N, neutral; D, disagree/strongly disagree).

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