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Oncology Section

Review Article

# Comprehensive Analysis of Chest Wall Resection: Indications, Reconstruction, and Results: A Systematic Review

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## ABSTRACT

**Introduction:** Chest wall neoplasms encompass primary, locally invasive, and metastatic tumours. Malignant chest wall tumours are typically uncommon, comprising roughly 5% of all thoracic neoplasms and 1 to 2% of all primary tumours. This systematic review addresses the imperative need for a comprehensive analysis of chest wall resection, focusing on indications, reconstruction techniques, and outcomes, to provide clinicians with evidence-based guidelines for optimal patient management.

**Aim:** To comprehensively review indications for chest wall resection, explore reconstruction techniques, and analyse complications and outcomes associated with the procedure.

**Materials and Methods:** A thorough electronic database search was performed on PUBMED Central, MeSH, NLM Catalog, Bookshelf, and PUBMED utilising the search terms "Chest wall," "Chest wall Resection," and "Chest wall Reconstruction." Full-text articles published in English within a 20-year period (from 1999 to 2020) were selected based on pre-defined inclusion and exclusion criteria and subjected to analysis as per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for systematic reviews.

**Results:** In total, 24 full-text records met the inclusion and exclusion criteria and underwent critical analysis for this systematic review. Chest wall sarcomas emerged as the primary indication for chest wall resection in the present study, with recurrent or locally advanced breast carcinoma also noted as significant causes. Various artificial soft meshes, notably Marlex or Goretex, were commonly employed for reconstruction, while soft-tissue coverage was achieved through various myocutaneous flaps, both pedicled and free. Respiratory complications predominated among the observed complications, with wound-related issues also documented.

**Conclusion:** Patient selection is paramount in chest wall reconstruction, with the ideal method still under debate. However, prioritising minimal patient morbidity during reconstruction is crucial. Adherence to these principles can lead to better outcomes in terms of complications, survival, and quality of life, especially in appropriately selected patients.


**Keywords:** Artificial soft meshes, Chest wall neoplasms, Complications, Morbidity

## INTRODUCTION

The chest wall comprises a complex unit consisting of 12 pairs of ribs, a central sternum, and a group of internal and external intercostal muscles. It serves as a structural barrier safeguarding vital organs such as the heart, lungs, great vessels, and upper abdominal organs. This structure strikes a delicate balance between flexibility and rigidity, adapting to respiratory dynamics with each breath while providing essential support for the skeleton. Given its critical role, dysfunction of the chest wall can lead to life-threatening morbidity and, in some cases, mortality.

Chest wall neoplasms, though uncommon, can arise from various components, including bones, cartilages, and soft-tissues such as muscles, nerves, and blood vessels [1]. These neoplasms are classified into primary, locally invasive, and metastatic lesions. Malignant chest wall tumours, in particular, are rare, accounting for approximately 5% of all thoracic neoplasms and 1 to 2% of all primary tumours [2]. Typically, malignant chest wall lesions manifest as symptomless, slow-growing neoplasms. However, they may cause pain if they involve nerves or other vital structures, underscoring the importance of early diagnosis.

The key to appropriate management lies in achieving an accurate diagnosis, conducting wide excision with a negative margin, and ensuring proper reconstruction with minimal morbidity [3]. The primary goals of chest wall reconstructions encompass the obliteration of dead space, restoration of chest wall rigidity, protection of intrathoracic vital organs, and provision of soft-tissue coverage to facilitate timely adjuvant therapy, if necessary [4]. Advances in the medical field have led to the development of new and improved prosthetic materials for reconstruction, coupled with refined surgical techniques, thereby enhancing the long-term surgical outcomes of chest wall neoplasms, with success rates exceeding 90% in recent times [5,6].

Locoregional recurrence of breast cancer poses a significant challenge; however, Full-Thickness Chest Wall Resection (FTCWR) emerges as a promising option, demonstrating favourable outcomes with low morbidity and mortality rates. It offers significant symptom palliation and the potential for cure in patients unresponsive to conventional multi-modality treatments [7,8]. The complexity of chest wall reconstruction arises from a multitude of factors, including the primary disease necessitating chest wall resection, the extent of resection, the choice of prosthesis material, and respiratory mechanics, among others.

The rationale for this review is rooted in the urgent need to address the challenges presented by chest wall neoplasms, despite their rarity, as they entail significant morbidity and mortality. Malignant chest wall tumours, often asymptomatic and slow-growing, underscore the critical importance of early diagnosis. Furthermore, advancements in medical technology and surgical techniques have transformed chest wall reconstruction, leading to improved long-term outcomes. However, the intricate nature of this procedure, coupled with the potential for life-threatening complications, emphasises the necessity of a comprehensive understanding of indications, reconstruction methods, and associated outcomes.

This review aimed to bridge a crucial knowledge gap by synthesising existing literature to offer evidence-based insights into optimal management strategies for patients undergoing chest wall resection. Specifically, the authors explored indications for chest wall resection, various reconstruction methods, and complications encountered during the procedure, with the goal of providing valuable insights into optimal patient management and outcomes.

## MATERIALS AND METHODS

A comprehensive electronic database search was conducted using Boolean operators "AND" and "OR" to effectively combine search terms. The search terms "Chest wall," "Chest wall Resection," and "Chest wall Reconstruction" were combined using these operators to generate relevant results. The search was performed on various databases including PUBMED Central, MeSH, NLM Catalog, Bookshelf, and PUBMED. Full-text articles published in English within a 20-year period (from 1999 to 2020) were selected based on pre-defined inclusion and exclusion criteria for further analysis.

Only articles published in English and studies conducted on humans were included. Articles were shortlisted based on pre-determined inclusion and exclusion criteria, which required the inclusion of studies with a malignant study population, description of the reconstruction method (including types of prostheses used and soft-tissue flaps to cover the prosthesis), and reporting of short-term outcomes such as complications and post-operative mortality. Studies not meeting these criteria were deemed ineligible and excluded. Detailed inclusion and exclusion criteria are provided in [Table/Fig-1].

| Inclusion criteria | Exclusion criteria |
|---|---|
| 1. Original articles<br>2. Studies conducted on human<br>3. Studies conducted irrespective of any particular age/gender criteria<br>4. Studies based on chest wall resection for malignant diseases | 1. Review articles/meta-analysis<br>2. Case reports or case series of fewer than 15 cases<br>3. Studies not conducted in humans<br>4. Articles not published in English<br>5. Articles based on chest wall resection for trauma |

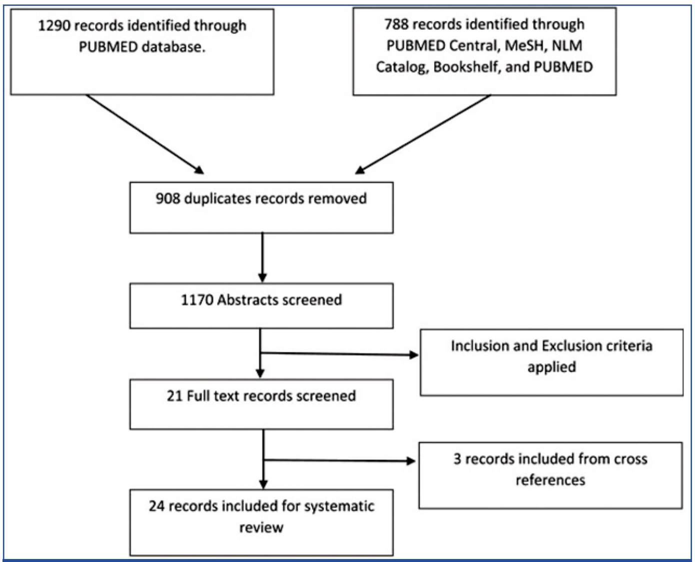
**[Table/Fig-1]:** Inclusion and exclusion criteria.

Risk of bias assessment was conducted for the included studies. Two reviewers independently assessed each study using the Cochrane Risk of Bias tool for randomised controlled trials and the Newcastle-Ottawa Scale for observational studies. Discrepancies were resolved through discussion, and if necessary, a third reviewer was consulted for consensus. Automation tools were not utilised in this process.

To address the risk of bias due to missing results in the synthesis, efforts were made to identify and include all relevant studies through a comprehensive search strategy. Additionally, the authors critically evaluated the included studies for any indications of reporting biases, such as selective outcome reporting. Any discrepancies or concerns regarding missing results or reporting biases were discussed among the review team to ensure transparency and accuracy in the synthesis process.

Utilising the afore-mentioned keywords, abstracts of articles from various National Centre for Biotechnology Information (NCBI) databases were initially screened, yielding a total of 2078 records. After removing duplicate articles and excluding non-human studies, 1170 studies remained for further assessment. These studies were then subjected to the pre-defined inclusion and exclusion criteria, resulting in the shortlisting of 21 articles. Additionally, three studies were identified through cross-references, bringing the total number of full-text records for critical analysis to 24. The study selection process from different databases was diagrammatically represented in [Table/Fig-2] using the PRISMA protocol.

Authors meticulously reviewed each selected study, documenting the investigator, number of cases, study population, and reconstruction method employed. Attention was particularly focused on the prosthetic materials utilised, soft-tissue reconstruction techniques for the chest wall resection wound, and complications reported in the studies. The primary objective was to identify various malignant




**[Table/Fig-2]:** Study selection protocol by PRISMA.

diseases of the chest wall necessitating resection, as well as the spectrum of reconstruction options utilised by different authors. Furthermore, the short-term outcomes in terms of complications and post-operative mortality were analysed. Data accuracy was ensured through individual verification by each author, and any discrepancies were resolved accordingly.

## RESULTS

The results of the systematic review encompassed analysis of 24 full-text articles, where-in clinical details, reconstruction techniques, and outcome data were meticulously documented. The majority of the studies provided comprehensive descriptions of the surgical procedures, including the types of prostheses used and soft-tissue coverage of the wound. Further details regarding the characteristics of the studies included in this review are provided in [Table/Fig-3] [7-30].

| Author, year of study | Total patients/ male/female | Mean/ median age (years) | Mean/ median ribs resected | Major indications of resection |
|---|---|---|---|---|
| Pameijer CR et al., 2005 [7] | 22/-/22 | 56 | 2 | Recurrent carcinoma breast |
| Veronesi G et al., 2007 [8] | 15/-/15 | 53 | | Recurrent/ Locally advanced carcinoma breast |
| Wald O et al., 2020 [9] | 25/16/9 | 33 | 2.5 | Chest wall sarcomas |
| Spicer JD et al., 2016 [10] | 427/236/191 | | 3 | Primary chest wall tumour<br>Metastatic lesion<br>Locally invading lung cancer<br>Malignant pleural disease |
| Downey RJ et al., 2000 [11] | 38/-/38 | 56 | | Carcinoma breast |
| Heuker D et al., 2011 [12] | 51/29/22 | 51 | 3 | Primary chest wall tumour<br>Secondary chest wall tumour<br>NSCLC<br>Mediastinal tumour |
| Mansour KA et al., 2002 [13] | 200/- | | 4 | Lung carcinoma<br>Chest wall tumour<br>Carcinoma beast |
| Weyant MJ et al., 2006 [14] | 262/139/123 | 60 | 3 | Metastatic/ recurrent tumour<br>Primary chest wall tumour<br>Contiguous lung carcinoma |

| | | | | |
|---|---|---|---|---|
| Hanna WC et al., 2011 [15] | 37/- | 49 | | Primary chest wall tumour metastatic chest wall tumour Desmoid tumour |
| Puviani L et al., 2013 [16] | 60/40/20 | 49 | | Primary chest wall tumour metastatic chest wall tumour |
| Cardillo G et al., 2013 [17] | 34/30/4 | 61.8 | 2.7 | NSCLC |
| van Geel AN et al., 2011 [18] | 60/24/36 | | | High-grade STS DFSP, Desmoid tumour |
| Lans TE et al., 2009 [19] | 220/57/163 | 56 | | Carcinoma breast Chest wall sarcoma Lung carcinoma |
| Petrella F et al., 2020 [20] | 40/-/40 | 59 | 2.5 | Carcinoma breast |
| Wang L et al., 2019 [21] | 18/6/12 | 44.5 | | Sarcomas |
| van Geel AN et al., 2009 [22] | 29/-/29 | 56 | 3 | Carcinoma breast |
| Leuzzi G et al., 2015 [23] | 175/78/97 | 57 | 3 | Primary chest wall tumour Secondary tumours |
| Yang H et al., 2015 [24] | 27/16/11 | 48 | 3 | Chest wall tumours |
| Bilal A 2015 [25] | 220/143/77 | 27.8 | | Primary chest wall tumour |
| Bagheri R et al., 2014 [26] | 40/20/20 | 43.72 | | Primary chest wall sarcoma |
| Aghajanzadeh M et al., 2015 [27] | 43/27/16 | 48 | 3.5 | Primary and metastatic chest wall tumours |
| Aghajanzadeh M et al., 2010 [28] | 162/113/49 | 40 | | Primary chest wall tumour Lung carcinoma |
| Tamburini N et al., 2019 [29] | 26/19/7 | 65.5 | 3.6 | Primary and secondary chest wall tumours |
| Foroulis CN et al., 2016 [30] | 20/10/10 | 59 | | Chest wall sarcoma |

**[Table/Fig-3]:** Studies and their characteristics included in the review [7-30].
NSCLC: Non-small cell lung cancer; STS: Soft-tissue sarcoma; DFSP: Dermatofibrosarcoma protuberans

The mean or median age of the patient population in most studies was observed to be in the from the fourth to the sixth decade, with only two studies reporting a younger study population [9,25]. Chest wall sarcomas emerged as the primary indication for chest wall resection in the present systematic review. These tumours may either originate from chest wall components or be secondary involvements [9,10,12,15,16,18,23,25-28]. Additionally, several studies included patients with recurrent or locally advanced carcinoma of the breast necessitating chest wall resection surgery [7,8,11,20,22], while others predominantly featured patients with locally invasive lung carcinoma [13,17,29].

The reconstruction process involves two components: prosthetic and soft-tissue. Marlex or Goretex mesh emerged as the primary prosthetic material used by the majority of studies [7-9,11,12,15]. These materials are characterised by their softness. Some surgeons also utilised rigid mesh made of bone cement (Methyl Methacrylate) or bone cement sandwiched with a prolene mesh [10,13,14,26,27]. Additionally, homologous Dura mater, Fascia Lata, and Bovine Pericardium were employed by a few authors [16-19], while Titanium Mesh was preferred in a minority of studies [16,24,29].

For soft-tissue coverage of the defect or the reconstructed chest wall, the majority of studies utilised pedicled muscle flaps [7-11,13-15,23-26], with some authors also employing free flaps [13,14]. Three studies incorporated Pedicled Omentoplasty for soft-tissue cover as well [18,19,22]. Given the complexity of the surgery, post-operative recovery was often challenging, with some studies reporting peri-operative mortality primarily due to respiratory complications [7,12,14,18,19,28]. Furthermore, respiratory-related complications were observed in many studies [10,13,14,15,27-29], with Spicer JD et al., reporting an overall 24% incidence of respiratory complications [10]. Wound-related complications, including infection, flap necrosis, or prosthesis infection with or without prosthetic removal, were predominant in others [7,9,11,16,19,20,26]. Spicer JD et al., also noted that smoking, the number of resected ribs, and concomitant pulmonary lobectomy were significantly associated with pulmonary complications [10]. Details regarding the reconstruction techniques and complications encountered in different studies are provided in [Table/Fig-4] [7-20,22-29].

| Author, year of study | Total patients | Reconstruction | Complications | Mortality |
|---|---|---|---|---|
| Pameijer CR et al., 2005 [7] | 22 | Marlex or Goretex mesh with myocutaneous flap | Wound related- 32% | 1 patient |
| Veronesi G et al., 2007 [8] | 15 | Marlex mesh rigid mesh with vascularised pedicled myocutaneous flap | Edge necrosis of flap- 1<br>pleural effusion- 2 | None |
| Wald O et al., 2020 [9] | 25 | PTFE Goretex patch repair- 16<br>Rotational flap- 4<br>Primary repair- 8 | Superficial infection- 2<br>Flap dehiscence- 1<br>Hematoma- 1 DVT- 1 | None |
| Spicer JD et al., 2016 [10] | 427 | Rigid prosthesis- 82 (19%)<br>Flexible mesh- 345 (81%)<br>Vascularised muscle flap + prosthesis- 69 (16%)<br>Muscle cover alone- 55 (13%) | Pulmonary complication- 102 (24%)<br>Wound infection- 12 (2.8%) | None |
| Downey RJ et al., 2000 [11] | 38 | Marlex/PTFE mesh<br>Myocutaneous flaps (Pedicled/Free) | Prosthetic infection- 2<br>Wound infection- 2 | None |
| Heuker D et al., 2011 [12] | 51 | Marlex/Goretex prosthesis with flap- 19 (37%)<br>Prosthesis alone- 14 (27%)<br>Flap alone- 4 (8%)<br>Primary repair- 14 (27%) | | 2 patients |
| Mansour KA et al., 2002 [13] | 200 | Prolene Mesh/Marlex/Methyl methacrylate/PTFE/Vicryl mesh<br>Pedicled flap- 96 (48%)<br>Free flap- 17 (9%)<br>Omental flap- 20 (10%)<br>Skin graft- 23 (12%) | Pneumonia- 27 (14%)<br>Acute Respiratory Distress Syndrome- 11 (6%)<br>Flap loss- 10 (5%) | None |
| Weyant MJ et al., 2006 [14] | 262 | Rigid prosthesis- 112<br>Non rigid prosthesis- 97<br>Pedicled myocutaneous flap- 38<br>Free flaps- 8<br>Rotational/Advancement flap- 5 | Respiratory failure- 29 (11%)<br>Wound dehiscence- 3<br>Hematoma- 3<br>Wound infection- 14 | 10 patients |

| | | | | |
|---|---|---|---|---|
| Hanna WC et al., 2011 [15] | 37 | Marlex prosthetic mesh- 49%<br>Muscle flap- 70% | Pneumonia- 8%<br>Wound infection- 5%<br>Re-surgery for Infection/Bleeding- 8 | None |
| Puviani L et al., 2013 [16] | 60 | Fascia Lata alone- 28<br>Fascia lata with Titanium plate- 31<br>Fascia lata with Titanium plate and Dual mesh- 1 | Wound dehiscence- 2<br>Hematoma- 2<br>Seroma- 1 | None |
| Cardillo G et al., 2013 [17] | 34 | Bovine pericardium- 4<br>Goretex- 3<br>Vicryl mesh- 3<br>Marlex- 2 | Atrial fibrillation- 3<br>Bronchopleural fistula- 1<br>Bleeding- 1<br>Respiratory insufficiency- 2<br>Cardiac failure- 2 | None |
| van Geel AN et al., 2011 [18] | 60 | Homologous Duramater/Polyurethane/Vicryl Mesh/ Double layer PTFE with Pedicled Omentoplasty | Acute respiratory distress syndrome- 1<br>Pneumonia- 1<br>Graft explant due to infection- 3 | 1 patient |
| Lans TE et al., 2009 [19] | 220 | Homologous Duramater/Polyurethane/Vicryl Mesh/ Double layer PTFE- 129 Pedicled Omentoplasty with skin grafting- 58 | Wound infection- 24<br>Wound necrosis- 17<br>Removal of prosthesis- 9<br>Hemorrhage- 8 | 5 patients |
| Petrella F et al., 2020 [20] | 40 | Prolene/vicryl/Titanium mesh- 34<br>Pedicled myocutaneous flap- 30 | Flap ischemia- 5%<br>Prosthetic infection- 7.5%<br>Bleeding- 2.5% | None |
| van Geel AN et al., 2009 [22] | 29 | Inlay mesh- 25<br>Omentoplasty- 6 | Infected mesh- 1<br>Skin necrosis- 1<br>(Both required Resurgery) | None |
| Leuzzi G et al., 2015 [23] | 175 | Goretex/Vicryl- 39<br>Myocutaneous flap- 15 | Anemia- 7 (31.8%)<br>Seroma- 5 (22.7%)<br>Haematoma- 2 (9.1%)<br>Arrythmia- 2 (9.1%)<br>Respiratory complications- 4 | |
| Yang H et al., 2015 [24] | 27 | Titanium mesh<br>Myocutaneous flaps | Seroma- 2<br>Pneumonia- 2 | None |
| Bilal A 2015 [25] | 220 | Primary closure- 107<br>Marlex mesh- 98<br>Marlex with methyl methacrylate- 15 | Flail chest- 8 | 5 patients |
| Bagheri R et al., 2014 [26] | 40 | Prolene with Cement and myocutaneous flap- 77.5%<br>Primary repair- 12.5%<br>Prolene mesh with myocutaneous flap- 10% | Wound infection- 4<br>Seroma- 2<br>Atelectasis- 2 | None |
| Aghajanzadeh M et al., 2015 [27] | 43 | Sandwich of 2 layers of prolene with bone cement with soft-tissue cover | Atelectasis- 4<br>Pneumonia- 2<br>Acute respiratory failure- 2<br>Wound infection- 3<br>Seroma- 4<br>Hematoma- 2 | None |
| Aghajanzadeh M et al., 2010 [28] | 162 | Primary repair- 86<br>Prolene/Marlex/bone cement- 76<br>Pedicled muscle flap- 16 | Atelectasis- 8 (3.7%)<br>Atrial fibrillation- 5 (6%)<br>Pneumonia- 4 (5%)<br>Wound infection- 3<br>Seroma- 2<br>Hematoma- 2 | 6 patients |
| Tamburini N et al., 2019 [29] | 26 | Titanium mesh- 26<br>Primary repair over mesh- 19 (73%)<br>Muscle flap- 7 (27%) | Pneumothorax- 2 (8%) Bleeding -1 (4%)<br>Pulmonary embolism- 1<br>Wound infection- 1 | None |

**[Table/Fig-4]:** Reconstruction and complications in different studies [7-20, 22-29].

Several studies included in the systematic review reported survival data for patients who underwent chest wall resection. Veronesi G et al., Pameijer CR et al., Petrella F et al., and Van Geel AN et al., investigated chest wall resection for locally advanced or recurrent carcinoma of the breast. Veronesi G et al., reported 1- and 2-year overall survival rates of 77% and 71.4%, with disease-free survival rates of 38% and 29.7% respectively. Pameijer CR et al., and Petrella F et al., reported 5-year overall survival rates of 71% and 68.5%, and disease-free survival rates of 67% and 45.5%, respectively. Van Geel AN et al., reported mean overall survival and disease-free survival of 12 months and 36 months, respectively [7,8,20,22].

Wald O et al., Heuker D et al., Van Geel AN et al., Yang H et al., and Bagheri R et al., evaluated chest wall sarcoma patients and reported survival data. Wald O et al., reported 3-year and 5-year overall survival rates of 80%, while Heuker D et al., reported rates of 53% and 50.4%, respectively. Van Geel AN et al., reported overall survival and disease-free survival rates of 46% and 30% at 5 years, and 33% and 25%, respectively at 10 years. Yang H et al., reported 5-year overall survival and disease-free survival rates of 72.1% and 80.8%, respectively [9,12,18,24].

## DISCUSSION

The discussion encompasses a variety of tumours necessitating chest wall resection, including primary chest wall tumours, metastatic lesions, and locally advanced breast or lung carcinoma. Locally advanced breast carcinoma and lung carcinoma are among the most common indications for this procedure [13,14]. While chest wall resection can be curative for non-metastatic and resectable tumours, it also serves palliative purposes for ulcerative lesions, pain management, and bleeding control.

The history of chest wall reconstruction dates back to Tansini's pioneering work in 1906, where an anterior chest wall defect was covered by a pedicled latissimus dorsi flap [31]. The use of metal prostheses was first reported by a French surgeon in 1909 [32]. Reconstruction methods vary based on factors such as defect size, location, surrounding structure viability, and margin of primary disease resection [33]. Despite the plethora of prosthetic materials developed since then, the ideal material remains controversial. The ideal prosthesis should be biologically inert, malleable enough to conform to the chest wall's shape, yet rigid enough to prevent paradoxical movements during breathing [34,35].

In line with the present systematic review, the majority of studies utilise non-absorbable synthetic woven meshes, such as polypropylene, polyester, and Polytetrafluoroethylene (PTFE) soft-tissue patches, often doubled over and sutured to adjacent ribs and fascia to cover the immediate surface of the chest wall defect [36]. Wound infection emerges as a major complication encountered by many authors, sometimes necessitating re-surgery to remove the prosthesis [7,11,16,19,22]. Literature suggests a wound infection rate for prostheses between 10% and 25%, including cases requiring prosthesis removal [36,37]. In response, some authors prefer biological materials such as bovine pericardium or homologous duramater as they exhibit resistance to infection [16-19].

Recent developments have seen the use of dedicated titanium plates for chest wall reconstructions, leveraging advantages such as low weight, bio-inertness, non-corrosiveness, and high tensile strength [38,39]. Regardless of the reconstruction method employed, soft-tissue coverage remains crucial for prosthetic cover, viscera protection, and additional bulk. This can be achieved through various means, including primary skin closure, pedicle or free myo-cutaneous flaps. Among muscle flaps, the latissimus dorsi flap is particularly noteworthy, considered the workhorse for chest wall reconstruction, especially for ipsilateral defects. The long length of its pedicle allows for better free flap also [40]. The pectoralis major myo-cutaneous flap, with its dual blood supply, serves as an excellent option for the anterosuperior aspect of the chest [41,42]. The omental flap, based on the left or right gastroepiploic artery, offers versatility in reaching any location of the chest wall, though it may require laparotomy and carries the risk of epigastric hernia [43,44]. Rectus muscle flaps, either transverse or vertical (TRAM or VRAM), are also utilised based on the orientation of the skin island [45].

Chest wall surgery carries significant morbidity and mortality; however, advancements in post-operative care and surgical techniques have led to improvements in survival rates. Most studies in our systematic review suggest a 5-year overall survival ranging between 52% to 60% for primary chest wall sarcoma [46-48]. Despite the abundance of data on chest wall resection, determining the ideal patient and optimal method remains a topic of debate. The reconstruction rate reported in the literature varies widely, ranging from 40% to 60% [49].

Some authors caution against reconstructing defects located posteriorly or those covered by the scapula. However, they recommend reconstruction if the defect is not covered by the scapula, exceeds 5 cm in size, or results from the resection of three or more ribs [33].

## CONCLUSION(S)

Chest wall resection and the subsequent reconstruction of defects present a critical task with the aim of minimising morbidity for patients. The selection of suitable candidates for surgery is paramount, balancing oncological considerations with the patient's medical fitness to undergo such a complex procedure. Utilising imaging techniques and personalised approaches to prosthesis selection are crucial steps in optimising treatment outcomes. Adherence to these principles holds the potential to improve outcomes in terms of complications, survival rates, and overall quality of life for appropriately selected patients.

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