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Abstract

Temporary Abdominal Coverage with Malex Mesh Prosthesis in Cases of Severely Injured Abdominal Trauma Patients

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Background: Abdominal compartment syndrome has multiple etiologies that are not only related to trauma but also any problem condition in the absence of abdominal injury. To determine whether prevention of the abdominal compartment syndrome after celiotomy for trauma victims justifies the use of temporary abdominal coverage with monofilament knitted polypropylene mesh (Malex mesh) in severely injured patients.

Method: Medical records at the Ajou University Medical Center were reviewed for a 32-month period from May 1st, 2002 to December 31st, 2004. Twenty-nine consecutive patients requiring celiotomy who were survived until at the end of celiotomy received temporary abdominal coverage and staged abdominal repairs with Malex mesh. One of them was dissecting aortic aneurysm patient and the others were all trauma victims. Malex mesh prosthesis coverage was used in cases of abdominal compartment syndrome due to excessive fascial tension, severe bowel edema and retroperitoneal hemorrhage or edema followed by staged abdominal repairs.

Result: Eighteen of twenty-nine patients were survived. Demographic characteristics, injury severity number of abdominal-pelvic bone injuries, mortality rate, complications, number of operations for permanent closure, required time for permanent closure showed no difference between man and women or child and adult. Except one dissecting aortic aneurysm patient, trauma cases showed 3.24 ± 0.98 injury sites. All cases that received temporary abdominal coverage

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and staged abdominal repairs did not show abdominal compartment syndrome. 10.08 ± 5.85 days and 2.27 ± 0.82 times of operation required making permanent abdominal closure after temporary abdominal coverage followed by staged abdominal repairs. Most of surviving patients have shown antibiotic-resistant organism and fungus infection. Patients who received permanent closure recovered from infectious problem completely.

Conclusion: The use of Malex mesh for temporary abdominal coverage in severely injured patients undergoing celiotomy was effective treatment method.

Key Words: Abdominal compartment syndrome, Temporary abdominal coverage, Staged abdominal repairs

가 ,

가

(3).

가

(abdominal compartment syndrome)

(multiple organ failure)
(Fig. 1)(4,5).

가

damage control surgery

가 (temporary abdominal coverage, TAC)

(1).

가 ,

가

(, staged abdominal repairs, STARs).

polyglycolic acid mesh

mesh zipper Velcro
(Velcro USA Inc, Manchester, USA)

(1).

(re-perfusion injury) 가

가 mesh

가 (2).

monofilament knitted 11
polypropylene mesh (Marlex, CR Bard Inc,
Murray Hill, USA)

AIS(Abbreviated Injury Score)
ISS(Injury Severity Score)

2002 5 1 2004 12
31 32 Kron

(6).

28

1

가

18

ABDOMINAL COMPARTMENT SYNDROME

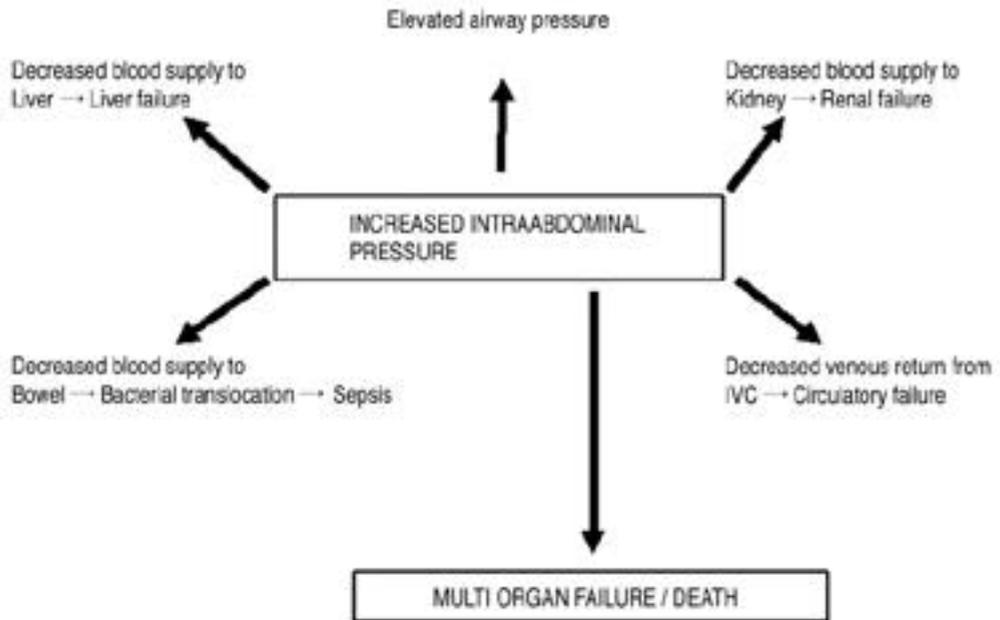


Fig. 1. Mechanism of Multi-organ failure due to abdominal compartment syndrome

— : mesh —

skin stapler

(Fig. 2).

1 5

가 가 ,

mesh

1-0 Nylon (contin . 1-0 Loop polydioxanone

uous running suture) (PDS) , 1-0 Nylon , Stainless

mesh 가 가 가 30 cm² 가 4

mesh 가 가 Vicryl mesh 1-0 Vicryl

0.5 cm (Fig. 3).



Fig. 2. A 46 year-old man with left renal rupture and spleen rupture and left lobe of liver rupture. Photographs shows temporary abdominal coverage (TAC). (A). There is no space to put edematous bowel into peritoneal space. (B). The bowel is covered with 2 sheets of mesh. (C). Final coverage with vinyl is done with skin stapler. (D). Couple of days later, bowel edema is subsided markedly.

— 18 1 —

± 11

SPSS version 10.0 10

Student's t-test , 95% (Fig. 4).

ISS 가 (p>0.05).

1. 2.

5 66 , 35.4

±15.7 4

5 13

22 , 7 2 , 4 , 4 , 6 ,

3.14:1 . 18 9 , 14 ,

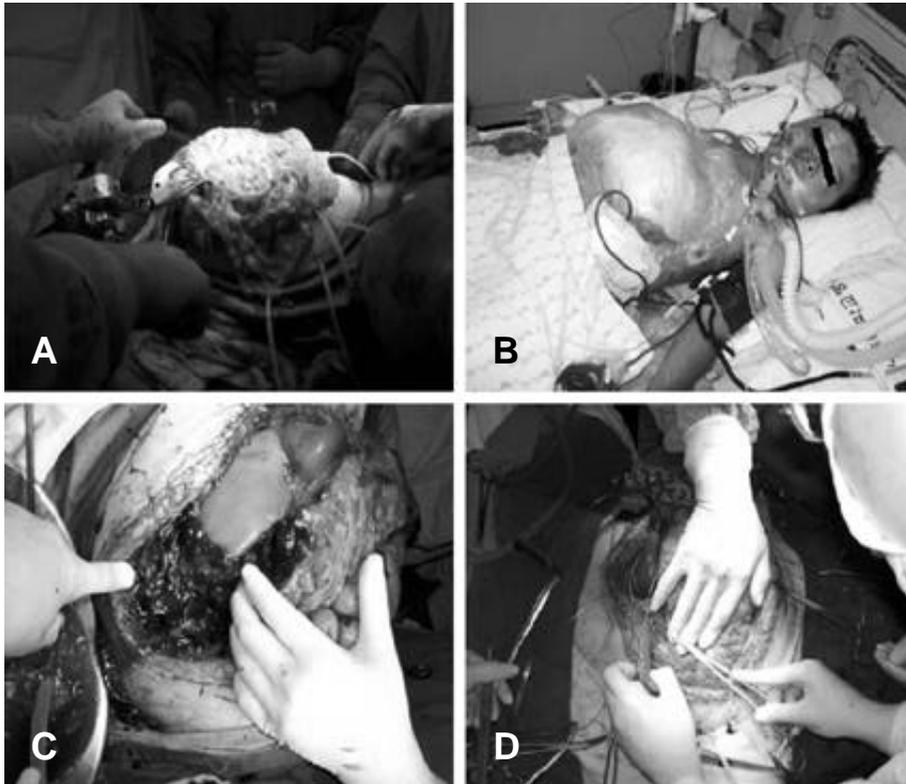


Fig. 3. A 5 year-old boy with left side diaphragm rupture and spleen rupture and right lobe of liver rupture and pelvic bone fracture. Photographs shows staged abdominal repairs (STARs). (A). There is no space to put edematous bowel into peritoneal space. (B). The child patient lies down on the bed of ICU. (C). Re-exploration for further bleeding control and drainage is done. There is no more active bleeding and remaining liver looks healthy. (D). The operator is doing permanent abdominal closure with 1-0 Nylon and Stainless steel wire suture material as like in adult patients.

— : mesh —

5 , 14 , 6 , 3 4

9 , 11 , 4 ,

1

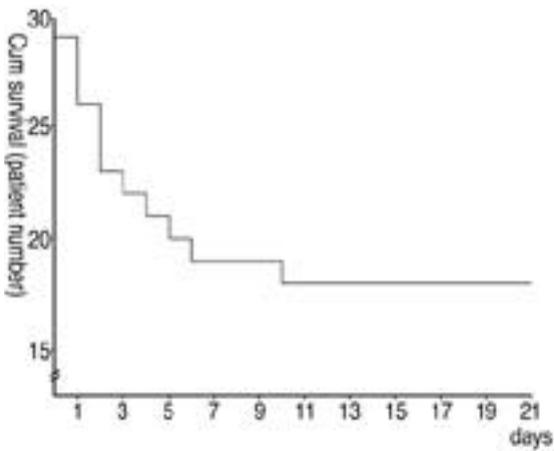
28

3.24±0.98 (Fig. 5).

Vaughn
(Vaughn's pyloric exclusion)

(Fig. 6).

3.



4.

Fig. 4. Cumulative survival of patients. There is no more death after 10 days of postoperative period.

20 mmHg

6 20 mmHg

72 20 mmHg

가

20 mmHg

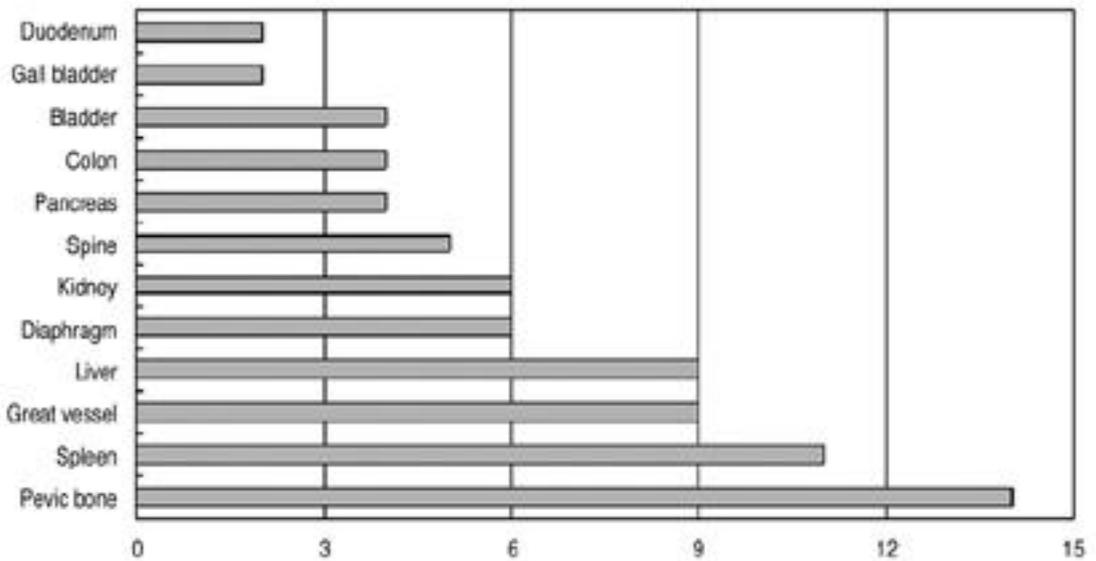


Fig. 5. Injury site of patients

— 18 1 —

4 21
 10.08 ± 5.85

2.27 ± 0.823

5
 가 2 . 4

monofilament knitted polypropylene mesh

18 8 9 1

1 5 cm
 (incisional hernia)

5.

(closed thoracotomy)
 catheter)

(pigtail
 (percutaneous
 catheter drainage)
 가 18

(pneumatocele)

2 18 14

가 가

MRSA

가 가

Maxwell

mesh 6

(7).

2가
 damage con-

control surgery

Candida albicans 가 4 , Candida tropicalis 가 9
 MRSA VRE

(Methicillin-Resistant Staphylococcus Aureus)
 가 12 , VRE (Vancomycin-Resistant Enterococcus)
 Enterococcus faecium, Enterococcus faecalis 7

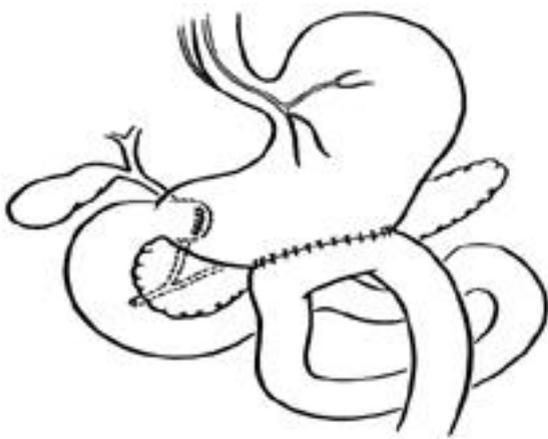


Fig. 6. Illustration of Vaughn's pyloric exclusion procedure used as adjuncts to repair of severe duodenal or combined duodenal-pancreatic injury.

1

2

가

(8).

가

Ivatury

70

가

, 45

,

가

mesh

Diebel

,

25

가

가,

mesh

가가

(12). Mayberry

146

(mucosal barrier)

mesh

73

mesh

ISS

(9).

Eleftheriadis

APTS (Abdominal pelvic trauma score)가

radical)

가

(oxygen free

(10).

mesh

가

Bloomfield

가

(13).

가

가

가

Widergren

(11).

가

22 mmHg

Pusajo

10 mmHg

(14,15).

가

Burch

가

1

4

3

4

3

20 mmHg

가

(16).

가

가

가

가

24

40 mmHg

가 1

4

20 mmHg

1

3

— 18 1 —
 . 11 10
 70%
 가 가 가 가
 가 가

(Fig. 3)(17).

가 10 ,
 가
 . 2
 4 20 mmHg
 6 4 가 10
 10 가
 가 (p>0.05)

(18).
 polyvinyl chloride (Bogota bag),
 polypropylene, reinforced silastic, polytetra-
 fluoroethylene (Gore Tex),
 polyglycolic acid (Dexon),
 polyglactic acid (Vicryl)
 Bogota bag

가
 50%가
 (17).
 38%
 가

가
 가 가
 가 가
 Malex mesh
 (C. R. Bard, Inc., Murray Hill, USA) 가
 25.4x35.6 cm
 mesh 2 3 1-0 Nylon

가 mesh 가
 mesh 가
 - (entero-cutaneous fistula)
 (1).

가

가

Malex mesh

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