

JEJUNAL SEROSAL PATCH REPAIR AS AN ALTERNATIVE TO OMENTAL PATCH REPAIR FOR LARGE PEPTIC ULCER PERFORATIONS.

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Abstract

The Selection Of Appropriate Technique For Repair Of Large Peptic Ulcer Perforations Is A Debatable Topic. Small Perforations Are Easily Managed By Placing An Omental Patch Over The Perforation, Famously Known As Modified Graham's Patch Repair. Large Size Perforations (>1cm) Pose A Great Challenge Because They Need Different Operative Strategy And Associated With High Morbidity And Mortality Ranging Upto 30%. We Compare Omental Patch Repair With The Jejunal Serosal Patch Repair In Treating Such Perforations. This Is A Randomised, Prospective Study Conducted In Department Of Surgery, Government General Hospital, Anantapur In Between June 2022 And June 2023. 40 Patients Presenting Clinically As Perforated Peptic Ulcer, Confirmed By Investigations Were Selected. However, Criteria Of Size >1cm Was Decided Intra- Operatively. 20 Cases Were Treated By Omental Patch (Group A) And Other 20 By Jejunal Serosal Patch (Group B). Most Common Age Group In This Study Was 50-60 Years With Greater Incidence In Males. 32 (80%) Males And 8 (20%) Females.

Mean Operative Time Was 60±10 Mins In Group A And 80±15 Mins In Group B. 5 Out Of 20 Patients Developed Post Operative Leak In Group A (25%) Whereas Only One Patient In

Group B Developed Leak. (5%). 5 Patients Developed Wound Infections In Group A And 4 Patients Ended Up With Wound Infections In Group B. Mean Hospital Stay Was 10+/-2 Days In Group A And 11+/- 2 Days. Large Perforations Carry High Morbidity And Mortality. The Management Of Large/Giant Peptic Perforations Is Difficult And Presents A Great Challenge To Surgeons. Various Surgical Modalities Can Be Used To Tackle Such Surgical Issues. Jejunal Serosal Patch Is One Suitable Alternative With Less Incidence Of Post Operative Leakage Rate Compared To Omental Patch In Case Of Large Peptic Ulcer Perforations.

Keywords:Jejunal Serosal Patch Thal Patch Large Peptic Ulcer Perforation Duodenal Ulcer Perforation Surgery Omental Patch Graham's Patch Repair

Introduction

Peptic Ulcer Perforations Usually Occur As A Result Of Peptic Ulcer Disease Or Endoscopic Interventions And Are Managed Conventionally With An Omental Patch Repair. Depending On The Size Of The Perforation. Many Procedures Have Been Described For Large Peptic Ulcer Perforations Which Include Drainage And Pyloric Exclusion, Gastrectomy, Gastrojejunostomy, Jejunal Serosal Patch Repair (Also Known As Thal Patch), Pancreaticoduodenectomy. However, Many Of These Operations Are Technically Demanding And Require Long Operating Time. The Ideal Repair Is A One Which Can Be Easily Done, And Able To Be Performed Rapidly In A Damage Control Scenario. The Consequences Of Insufficient Repairs Can Be Devastical, Resulting In Large Leaks Leading To Abdominal Contamination, Sepsis And Death. Most Of These Techniques Are Associated With High Rate Of Wound Infections. Peptic Ulcer Perforations Comprise Of 10–20% Of All Complications Of Peptic Ulcer Disease [1]. There Is No Adequate Data Or Studies To Show The Superiority Of One Technique Over The Other And The Appropriate Surgery For Large Peptic Ulcer Perforations Is Still A Topic For Debate.

Perforated Large/Giant Peptic Ulcers Represent ~1–2% Of The Perforated Peptic Ulcers And Carry Significant Morbidity (20–70%) And Mortality (15–40%). The Size Of The Perforation Has A Great Effect On Mortality Rate And Adversely Affects The Prognosis, As Perforation Less Than 5 Mm Has 6% Mortality Rate, Between 5 And 10 Mm, The Mortality Goes Up To 19%, And If The Perforation Is More Than 10 Mm, The Mortality Reaches Upto ~24 % [2,3].

According To Gupta Et Al. [4], Perforated Peptic Ulcers Are Classified Into Three Main Categories:

- (1) Small Perforations: Smaller Than 1 Cm In Size, And Have The Best Prognosis.
- (2) Large Perforations: Varying From 1 To 3 Cm.
- (3) Giant Perforations: More Than 3 Cm.

Use Of The Word “Giant” Should Be Limited To Massive Defects In Which Omentopexy Is An Incomplete Procedure And Other Techniques Are Considered Important For Such Cases. Several Risk Factors Are Associated With High Mortality In These Patients, Such As Advanced Age, Coassociated Disease, Shock Status, Perforated Ulcer Size, Late Hospital Presentation, And Surgical Intervention. Surgery Should Be Performed Early As Much As

Possible In Large Peptic Ulcer Perforations In Ill Patients Where Pain And Abdominal Signs Are Evident. Literature Review Has Shown That The Jejunal Serosal Patch Applied To Seal Grossly Infected Peptic Ulcer Perforations Is A Reliable Procedure. Kobbold And Thal In An Experimental Setting Described The Use Of A Jejunal Serosal Patch To Close The Duodenal Defect In A Canine Model. James And Santa In 1965 Reported The First Clinical Application Of A Serosal Patch In Repair Of A Duodenal Fistula In A 55- Year Male, And They Reported A Perfect Perforation Closure Without Any Post Operative Leak.

Patients And Methods

This Prospective Study Was Conducted In A 1 Year Duration, During The Period From June 2022 To June 2023, The Department Of General Surgery Department, Government General Hospital, Anantapuramu. A Total Of 40 Patients Presenting To The Er Department Having Clinical Manifestations Highly Suspicious Of Perforated Peptic Ulcers, Which Were Confirmed By Radiological Investigations. After Immediate Resuscitation Of Patients, They Were Soon Transferred To The Emergency Operation Theatre And Emergency Exploratory Laparotomy Under General Anesthesia Was Performed. Patients Presented With Either Perforated Large/Giant Du Or Gu More Than 2 Cm (Figs 1,2). The Size Of Ulcer Was Determined On Exploration, Dissection Of Adhesions, Removal Of Debris And Necrotic Material. Preoperative Radiological Investigations Have No Or Little Role In Determining The Size Of Perforated Ulcer, Where The Selected Operative Procedures Were Performed After Confirming Size And Dimension Of Perforated Ulcer After Intraoperative Exploration Only. Perforations With Size Greater Than 2 Cm On Intra-Operative Exploration Were Selected For The Study Whereas Those With Less Than 2 Cm Were Not Included. They Were Divided Into Two Groups, With 20 Patients Each. Patients From Both Groups Have Their Operative Procedures Prefixed. As The Terms Large And Giant Ulcers Are Descriptive Only To Classify Perforated Ulcer According To Size Based On Gupta Classification, As Mentioned Before, Both Types Were Included In Our Study. Group A Patients Had Omental Patch Repair And Group B Had Jejunal Serosal Patch, There Were Certain Inclusion And Exclusion Criteria For Selection Of Patients. Major Inclusion Criteria Of Our Study Was Any Adult Patient With Peptic Ulcer Perforation More Than 2 Cm In Diameter. Exclusion Criteria Were Smaller Perforations Less Than 2 Cm. Malignant Ulcer Perforations Either Suspicious Or Proven By Edge Biopsy, Traumatic Rupture, Complex Duodenal Injuries, Blunt Trauma And Missile Bullets, All Were Excluded. Detailed Patient History Was Taken With Particular Attention To Smoking And Prolonged Use Of Nsaid, As 25(62.5%) Patients Were Heavy Smokers, And 15 (37.5%) Patients Were Chronic Nsaid Abusers.



FIGURE 1: 1 cm PERFORATED PEPTIC ULCER

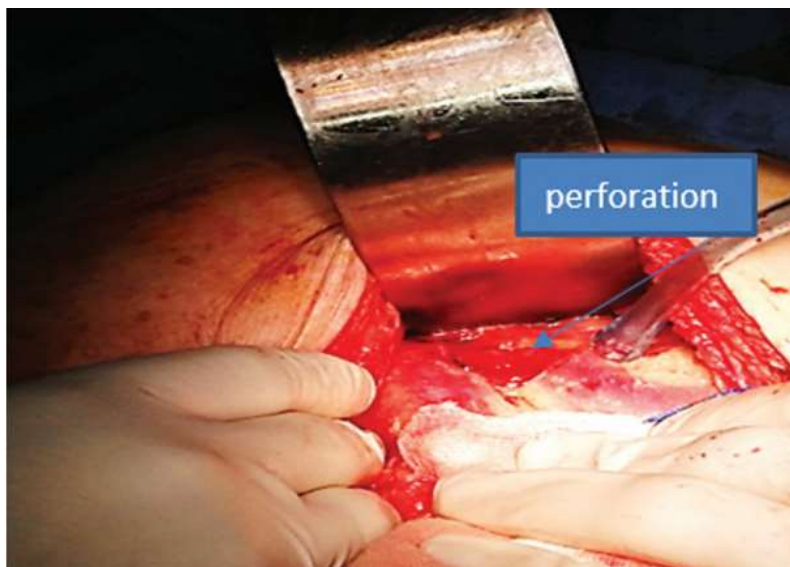


FIGURE 2: 2-3 cm PERFORATED DUODENAL ULCER

Most Patients [35 (87%)] Presented With Manifestations Of Peritonitis In The Form Of Generalized Abdominal Pain Fever And Tachycardia. Rigid Abdomen Was Noted On Examination. Shock Necessitated Rapid Resuscitation With Fluids. Wide Bore Intravenous Cannula For Fluid Rehydration With Close Monitoring Of Fluid Balance, Nasogastric Tube (Ngt), And Foley Catheter To Monitor Urine Output Were Done In All Cases; After Rapid Resuscitation And Stabilization, Antibiotics And Cross-Matching For Blood Transfusion Were Initiated. Each Patient Underwent Thorough Clinical Examination. Full Preoperative Laboratory Investigations Were Done Such As Complete Blood Count, Blood Urea Nitrogen, Serum Creatinine. Radiological Investigations Included Plain Erect Radiograph Chest And Upper Abdomen, Which Was Done For All Patients And Revealed Free Air Under Right Hemidiaphragm In 34(85%) Patients; Abdominal Ultrasound, Which Revealed Significant Collections In Pelvis And Subhepatic Space And Abdominal Computed Tomography With Contrast Was Done In Query Cases, Which Could Demonstrate Scattered Pneumoperitoneum

With Gas Loculus Clustered Around The Gastroduodenal Transition, Fat Straining With Signs Of Pyloric And Duodenal Wall Discontinuity, And To Exclude Pancreatitis. After The Diagnosis Was Confirmed, The Patient Was Taken To The Operating Theater For Exploratory Laparotomy. Closed Envelop Type Of Randomization Was Used To Classify Patients Into Both Groups. Patients And Attendants Were Explained In Detail Regarding The And Expected Complications And A Written Consent Signature Was Taken.

Surgical Techniques

Omental Patch

This Process Was Done For All Patients In Group A. It Is Famously Known As The Graham's Patch. In This Procedure, After Identification Of The Perforation Site, Free Edge Of Greater Omentum Which Was Well Vascularized Was Kept As A Patch Over It And Closed With 2-0 Silk Sutures (Round Bodied). Peritoneal Toilet And Lavage Was Done In All Cases, And A Wide-Pore Peritoneal Drain Tube Was Inserted At The Hepato-Renal Pouch (Fig. 3).

Jejunal Serosal Patching

All Patients In Group B Underwent This Procedure. It Is Famously Known As The Thal Patch. After Suctioning Out Of Intraabdominal Collections, Perforation Site Was Identified Via Gentle Dissection Of Adhesion, And Then Necrotic Tissue And Debris Were Debrided. Then, The Second Part Of Duodenum Is Mobilized. A Loop Of Jejunum About 40–60 Cm From The Ligament Of Treitz Was Selected And Brought Above The Transverse Colon And Sutured To Defect In Serosa-To Serosa Fashion With A Vicryl Or Silk Suture Preferably 2-0 In Size Taking Bites Atleast 2–3 Cm Away From Defect Site. At A Distance Of 20 Cm From The Patch Jejuno-Jejunostomy Was Performed. Intraperitoneal Wide-Pore Drain Was Inserted In The Pelvis And Right Subhepatic Space (Fig. 4)



FIG.3: OMENTAL PATCH REPAIR

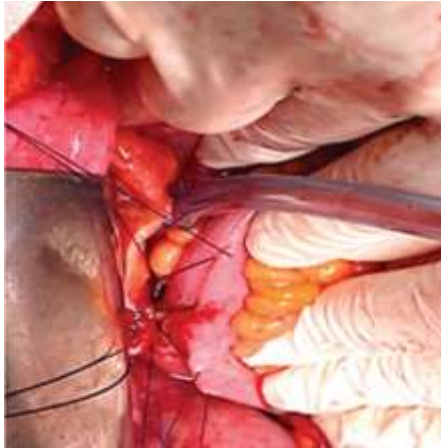


FIG.4: JEJUNAL SEROSAL PATCH REPAIR

STATISTICAL ANALYSIS

Data Were Presented As Percentages. The Differences In Surgical Outcomes Among The Two Groups Were Compared Using Unpaired T Test For Difference Between Two Study Group Means. Main Surgical Outcomes Analyzed Were The Mean Age Of Presentation, Mean Operating Time, Post-Operative Wound Infection, Post-Operative Leak, Mortality And Hospital Stay. The Pearson X² And Fisher’s Exact Tests Were Performed. P Values Were Reported, Where The Results Were Considered To Be Significant With P Value Less Than 0.05, And Non-Significant With P Value More Than 0.05.

Results

Of The 40 Patients Operated For Large And Giant Du Perforations At Our Department Over A Period Of One Year, There Were 32 (80%) Males And Eight (20%) Females, Giving A Male To Female Ratio Of 4: 1. The Mean Age Was 50±5 Years In Both Groups. The Mean Operative Time Was 60 ±10 Min In Group A, 80±15 Min In Group B, With Total Mean Operative Time Of 70±12.5 Min (Table 1).

TABLE 1: PRE-OPERATIVE DEMOGRAPHIC ANALYSIS

	GROUP A	GROUP B
NUMBER OF PATIENTS	20	20
MALE/FEMALE RATIO	17/3	15/5
MEAN AGE(YEARS)	50±5 YEARS	50±5 YEARS
MEAN OPERATING TIME (HOURS)	60±10 MINUTES	80±15 MINUTES
MEAN HOSPITAL STAY (DAYS)	10±2 DAYS	11±2 DAYS

In Group A Patients (20 Cases) Who Had Omental Patch Procedure, Five Patients (25%) Developed Post Operative Wound Infections. Four Out Of These Five Patients Improved After Conservative Management. One Patient (5%) Progressed Into Burst Abdomen Which Necessitated Closure With Secondary Tension Sutures And Was Discharged After 20 Days Of Hospital Stay. Five Patients (20%) Developed Post-Operative Leak In Group A, Two On The Third Post Operative Day And Three On Fourth Post Operative Day. Three Of These Patients Were Managed Conservatively Via Total Parenteral Nutrition (Tpn), Intravenous Antibiotics And Were Later Discharged After 10 Days. Two Patients Had To Be Re-Operated In View Of Their High Output Leaks Which Prolonged Their Hospital Stay To 3 Weeks. Mean Hospital Stay In Group A Was 10±2 Days. Overall Mortality Reported Was Four Out Of Twenty Patients. (20%)

Regarding Group B, 20 Patients Were Subjected To Jejunal Serosal Patching With Feeding Jejunostomy. Overall, Four Patients (20%) Developed Post Operative Wound Infections And All Of Them Recovered After Conservative Management. Only One (5%) Patient Developed Postoperative Bile Leak On The 4th Post-Operative Day. He Was Managed Conservatively In View Of Low Output And Complete Resolution Of Leak Was Detected Radiologically And Clinically. Two Patients Succumbed To Death In This Group (10%) In The Immediate Post Operative Period Most Probably Owing To Severe Septicemia And Chest Infection, With Poor Response To Antibiotics. Mean Hospital Stay In Group B Was 11±2 Days. Feeding Jejunostomy Tube Was Placed In Patients Of Both The Groups. P Value Came Out To Be Significant (0.03) In Case Of Comparison Of Post Operative Leaks In Both The Groups.

TABLE 2: POST-OPERATIVE COMPLICATIONS ANALYSIS

POST-OPERATIVE COMPLICATION	GROUP A	GROUP B	P VALUE
WOUND INFECTIONS	5	4	0.2 (INSIGNIFICANT)
POST-OPERATIVE LEAK	5	1	0.04 (SIGNIFICANT)
MORTALITY	4	2	0.3 (INSIGNIFICANT)

Discussion

Perforated Peptic Ulcer Is A Challenging Surgical Condition Especially When The Size Of Perforation Is Large. A Decreasing Trend Has Been Observed In The Rates Of Peptic Ulcer Perforations After The Advent Of Proton Pump Inhibitors(Ppi). Ulcer Perforation Represents 10–20% Of The Recognized Complications Of Peptic Ulcer Disease, And The Perforated

Large/Giant Ulcers Comprise ~1–2% Of The Perforated Peptic Ulcers And Account For Both High Morbidity (20–70%) And Mortality (15–40%). The Reported Mortality Rate Varies From 1.32% To Nearly 20% In Different Series [4,5,6]. A Study Was Done Among 245 Patients Who Were Operated For Perforated Peptic Ulcer Disease (Pud) And 30 Among Those Had Large/Giant Perforations, With The Overall Morbidity In Series Being 73.3%, And Overall Mortality Was 13.3%, Which Corresponds To That Published In The Literature. The Size Of Peptic Ulcer Ranges In Between 3mm To 3cm And This Aspect Affects The Prognosis Of Patient In Case Of Perforation [7]. There Is No Definite Study To Prove Which Size Ulcers Carry High Risk Of Leak And Mortality. This Difference In Size Of Large And Giant Ulcers Will Not Affect The Type Of Operation In Our Study. However, There Seems To Be A Strong Relation Between Ulcer Size And Perforation And To Consider That The Giant Dus More Than 2 Cm In Size Are Vulnerable To Perforate. According To Gupta And Colleagues, Perforated Ulcers Can Be Classified Into Two Types, Large Perforations With Size Ranging Between 1 To 3cm And Giant Perforations With Size Exceeding 3 Cm In Diameter. Our Study Mainly Focuses On The Large And Giant Perforated Ulcer And Compares Two Different Techniques Used To Manage Such Perforations [4]. All Patients In Our Study Were Diagnosed To Have Large Perforated Peptic Ulcer More Than 2 Cm (Du) During Intraoperative Exploration. Diagnosis Was Based Largely On Clinical Suspicion, As Most Of Cases [35 (87%) Patients] Presented With Peritonitis, And With Careful Clinical Examination, Diagnosis Was Confirmed With Radiological Investigations, Such As Plain Radiograph Of Lower Chest Upper Abdomen To Check Air Collection Under Right Hemidiaphragm With Sensitivity 70%, And Pneumoperitoneum With Sensitivity 22%, And Also Abdominal Ultrasound Was Performed And Detected Significant Collection In 12 (40%) Patients, With Sensitivity Of 32%. Since There Is No Definite Guidelines For Managing Large/Giant Perforations In The Literature, Various Authors Have Stressed On Different Techniques To Close Such Perforations Based On Their Experience And Research. These Procedures Include Partial Gastrectomy With Billroth I Or Ii Operation, Vagotomy And Antrectomy, Gastrostomy, And Lateral Duodenostomy With Feeding Jejunostomy. Others Recommended Conversion Of Perforation Into Pyloroplasty, Closure Of Defect With Serosal Patch Or Pedicled Graft Of Jejunum, Or The Use Of Free Omental Plug, And Even Suturing Of Omentum To Ngt. Proximal Gastrojejunostomy Can Be Added To Provide Diversion And Avoid Complications [8,9].

In Our Study, We Chose Two Techniques To Assess Efficacy, Safety, And Outcome In Managing Such Problem. In Our Study, 40 Patients Were Divided Into Two Groups (A And B) According To Surgical Procedure Applied For Each Group; Group A Patients Were Subjected To Omental Patch Repair, Famously Called As Graham's Patch Repair With Feeding Jejunostomy. Group B Patients Underwent Jejunal Serosal Patch Procedure And Feeding Jejunostomy.

The Highest Incidence Of Large/Giant Ulcer Perforation Was Seen Over 50 Years Old. In Our Study, The Average Age Group Was 50-60 Years Old. These Results Are On Par With Other Studies. Male-To-Female Ratio Was Found To Be 4: 1, As Thirty-Two (80%) Males, And Eight (20%) Females Were Present In Our Study, Whereas In Other Similar Studies, It Ranged From 8: 1 To 7.5: 7. Various Factors Play A Role In The Mortality Of Such Cases

Such As Old Age, Co-Morbidities, Time Since Symptoms Onset, Size Of Ulcer And Technique Used To Close The Perforation. In Our Study, Six (15%) Patients Died, Most Probably Owing To Severe Sepsis, Prolonged Operative Procedure, Long Duration Of Anesthesia Exposure, Bad Chest Condition With Nutritional Deficiency, And Poor Response To Antibiotic Therapy. The Presence Of Severe Duodenal Tissue Defect, Surrounding Edema, And Inflammatory Changes Are Devastating Factors, Which Are Associated With High Incidence Of Leakage And Septicemia. In Addition, Other Contributing Factors Are Said To Increase Leakage In Such Conditions, Including A Significant High Intraluminal Pressure, Eversion Of Duodenal Mucosa, And Pancreatic Enzyme Lytic Reaction.

There Are Multiple Options Described To Manage Such Large Perforations [10]. Such Procedures Have The Disadvantages Of Long Operative Time, Need High Level Of Surgical Experience, And Carry Considerable Risk Of Leak. Regarding Our Procedures, Group A Patients Underwent Omental Patch Procedure, And Five Patients (25%) Developed Post Operative Leak. In This Technique, The Repair Is Done From Outside, And So With Rise Of Intra-gastric Pressure, The Patch Could Be Easily Detached [11]. Regarding Group B Patients Who Had Jejunal Serosal Patching, Only One (5%) Case Presented With Leak. Several Series Have Failed To Show Difference In Morbidity And Mortality Compared With Primary Repair. There Are Few Case Reports Where Jejunal Serosal Patch Was Used Successfully To Close Large Perforations [12].

Conclusion

Large/Giant Perforations Are Rare But Carry A Significant High Level Of Morbidity And Mortality In Relation To Small Perforations. Both Techniques Of Repair Discussed Above Were Compared To Prove The Efficacy In Terms Of Post-Operative Complications. P Values Were Calculated To Assess The Significance Of Our Results. Jejunal Serosal Patch Technique Is A Suitable Alternative And On Par With The Conventional Omental Patch Technique With Less Incidence Of Post-Operative Leakage. However, Longer Operating Time And Requirement Of An Experienced Surgeon Are Two Drawbacks. Further Increasing The Sample Size Of Our Study Would Give More Definite And Promising Results.

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