经颈内静脉肝内门腔分流术远期疗效分析

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摘要:目的:探讨经颈静脉肝内门脉分流术(TIPS)后病人的远期分流道通畅率,生存期和生活质量。材料及方法:51 例 TIPS 术后病人,随访时间平均为 16.8 ± 12.8 月(1 天 - 49 月),用 Kaplan - Meier 法分析 TIPS 后病人的远期生存率,和分流道通畅率。用 COX 模型将生存期和通畅率与 Child - Pugh 肝功能分级和主要症状作相关分析,并预测影响生存期和分流道通畅率的因素。用 SF - 36 问卷评估病人的生活质量。结果:1 - 4 年累计生存率分别为 65%,56%,32%,19%。累计原发通畅率分别为 65%,56%,32%,19%。42 个月原发再次通畅率为 94%,18 个月 4 继发通畅率为 71%。肝功能 Child - Pugh 分级与累积生存率有显著性差异。影响 TIPS 术后 90 天生存率的相关因素有:酒精性肝硬化,腹水,急性出血,分流腔道直径,静脉曲张需栓塞者,肝性脑病,分流通道再狭窄及再发出血。TIPS 术后生活质量的所有 9 项指标均较术前提高,其中 4 项有显著性差异。结论:TIPS 对控制出血,腹水及改善近期生活质量有肯定的疗效,但是对病人远期生活率的确切作用尚有待于进一步的研究。

关键词:门脉高压 肝硬化 门脉分流 肝介入术 生活质量 生活质量

Long - term Results in Patients with Transjugular Intrahipatic Portosystemic Shunt: An Outcome Study

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Abstract Purpose: To determine the long - term shunt patency, long - term survival, and long - term quality of life in patients with transjugular intrahepatic portosystemic shunt (TIPS). Material and Methods: 51 patients who underwent TIPS were followed for a mean time of 16.8 ± 12.8 months (range 1 day to 49 months). Various statistical methods were used for analyzing the long - term survival and shunt - patency, correlation between Child - Pugh classification and indications for TIPS, and offer predictors of survival and patency, The SF - 36 was employed to assess the quality of life in these patients. Results: The cumulative survivalrate was 65%, 56%, 32% and

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19% at 1 -, 2 -, 3 - and 4 - years, respectively. The cumulative primary patency rate was 65%, 56%, 32%, 19%, the primary assisted patency at 42 months was 94% and the secondary patency at 18 months was 71%. There was a significant difference in cumulative survival rate in comparing Child - Pugh class A to B to C. There was no significant difference in survival between patients with the original indications of refractory ascites and variceal bleeding. Various factors including age, alcohol abuse, ascites, active bleeding, diameter of shunt, variceal embolization at the time of TIPS, encephalopathy, restenosis and rebleeding were confirmed as significant predictors for early 90 - day survival after TIPS. The post - TIPS scores of quality of life in all of 9 health categories were higher than before the procedure with statistically significant improvement in four. Conclusion: TIPS has positive efficacy for controlling bleeding or ascites and improving the long - term quality of life. The exact impact on the long - term survival in these patients, however, requires further clarification.

Key Words: Hypertension, portal; Liver cirrhosis; Shunt, portosystemic; Liver, interventional procedural; Quality of life, SF - 36

Although Transjugular intrahepatic portosystemic shunts(TIPS) have been widely used for the management of variceal bleeding and ascites secondary to portal hypertension since 1989(1), its effectiveness for variceal bleeding has only recently been proven (2 - 4). Several important questions remain to be answered relating to this relatively new technique such as late stent patency, survival, and quality of life after TIPS. For the purpose of evaluation of late survival and shunt patency, the effect of risk factors on survival and patency, and quality of life, we reviewed all patients who were treated with TIPS in Dartmouth - Hitchcock Medical Center.

Materials and Methods

Patients

A total 51 patients underwent a successful TIPS procedure from 54 candidates between March 1992 and November 1995, 26 men and 25 women, with a mean age of 54.78 years (range 30 - 75 years). All patients had portal hypertension, with endoscopically confirmed gastric and/or esophageal varices in 42(82.35%). The causes of the portal hypertemsion were alcoholic cirrhosis in 36 cases with accompanying hepatitis in 7, hepatitis B or/and C in 5, cryptogenic cirrhosis in 2, primary billiary cirrhosis in 2, sclerosing cholangitis in 1 and unknown in 5. The severity of liver disease as reflected by the Child - Pugh modified scoring system was: a in 10 Cases, B in 25 and C in 16, with an average scores of 10.6 ± 1.89(standard deviation). Before the procedure, ascites was detected in 30 patients and encephalopathy was clinically apparent in 14 patients.

Befor the TIPS procedure, repeated endoscopy was carried out in 32 patients. Endoscopically confirmed variceal hemorrhage was the main indication for TIPS in 31 cases, including 16 in whom the procedure was performed on an emergency basis for active bleeding. The indication for the remaining 20 patients was refractory ascites.

The mean pre - procedural laboratory values

and standard deviation were as follows: total serum bilirubin level of 3.14 mg/dl ± 3.01, serum albumin 2.86g/ dl ± 3.03, blood urea nitrogen 23.37 mg/dl ± 16.21, hematocrit 29.79% ± 7.68, prothrombin time 14.88 seconds ± 2.0, platelet count of 108.39×10^9 ml ± 22.63, serum ammonia 101.37 μg/dl ± 85.68, serum cratinine 1.07 mg/dl ± 0.61, GGT of 151 U/L ± 112.91, AST 83.82U/L ± 45.2 and ALKP 125.38U/L ± 64.46.

TIPS Procedure

Ring TIPS set (Cook, Bloomington, Ind) was used in all patients. In the first 15 patients, a 5 F catheter was introduced into the right portal vein by ultrasound - guided percutaneous puncture of the left portal vein, to facilitate right hepatic to right portal vein puncture. In the remaining patients, the standard TIPS technique was employed (5). Wedge hepatic venography was performed in 39 cases immediately before the TIPS creation. Co2 (Northeast Airgas, Salem, NH) was used as a contrast agent in 29 cases and Conary 43% (Mallinckrodt Med. Inc, St. Louis, MO) in 10. Wallstents (Schneider, Minneapolis, Minn) were employed in all of the patients in this study. The length and number of stents were determined empirically, as needed to provied a good shunt. Stents were dilated sufficiently to reduce the portosystemic gradient to 5 - 12 mmHg. If varices were still present after TIPS creation. they were embolized using Gianturco coils.

Quality of Life

A standardized, validated, widely used instrument, the RAND 36 - item Health survey 1.0 (SF - 36) developed for medical outcome study in U.S. by the RAND corporation was employed to assess quality of life (6). It consists of 36 items including four dimensions related to general health status (physical funcitioning [10 items], mental healty [5items], energy/vitality [4items], and general health perceptions [5itms]); three related to general quality of life(limitations due to physical role problems [4items], social functioning [2items], and limitation due to emotional role problems [3items]; and one related to both health status and quality of life: pain [2items]).

The scoring method is a two - step process. First, each item is scored on a 0 to 100 range so that the lowest and highest possible scores are set at 0 and 100, respectively. Scores represent the percentage of total possible score achieved. In step 2, items are averaged together to create each scores.

Two SF - 36 questionaire forms (one form for the status before TIPS and another for the status at the time of follow - up) were malied to the patients in November 1995 and May, 1996, respectively. Two weeks after the 2nd mailing, all patients who did not response to the mailed survey were interviewed by phone by an experienced research nurse.

Analysis Methods and Statistic

Kaplan - Meier Product - limited was employed for evaluating the following three factors regarding patent status: primary patency (the time from the initial tips to the first re - intervention), primary assisted patency (the time from the fist re - intervention revision of the shunt to the complete occlusion of the stent), and secondary patency (the time from re - intervention due to complete occlusion of the stent to the next complete occlusion or complete loss of shunt function). Angiography and/or Doppler ultrasound were used to determine the patency of the shunt. The shunt was considered a stenosis and was evaluated angiographically if the velocity was less 60mm/

sec. It was considered patent if flow by Doppler was stable at 100 – 200mm/sec.

The survival time of the patients correlated with Child – Pugh classification and major clinical symptoms of GI bleeding or ascites was analyzed using Kaplan – Meier Product – Limited.

In order to predict the survival time, multivariate analysis with Cox model regression was assessed using 18 factors including age, gender, alcohol abuse, Child – Pugh class, ascites, hemo – rrhage, hemorrhage + ascites, encephalopathy pre – TIPS, encephalopathy post – TIPS, active bleeding, rebleeding within 1 months after TIPS, initial shunt diameter, variceal embolization, post – TIPS gradient pressure, restenosis or occlusion, serum bilirubin level, serum creatinine and prothrombin time.

The Cox model regression was also employed to evaluate six factors which may have an impact on patency: length of the tract in the parenchyma of the liver , number of stents, diameter of the stent in the inital TIPS, gradient across the shunt after the initial procedure, length of uncovered hepatic vein from the proximal end fo the stent to the IVC, and prothrombin time at time of procedure.

Quality of life scores pre – TIPS and post – TIPS were compared using Studint's paired t test. The self – comparison of the scores were also correlated with Child – Pugh classification and indication for TIPS (variceal hemorrhage vs. ascites).

Differences were considered significant if P was <0. 05.

Results

Technical and Short – Term Results

Technical failure occurred in 3 patients with portal vein occlusion in a total of 54 initial TIPS attempts.

A single shunt was created in 50 patients and two parallel shunts in 1 patient. Variceal embolization with Gianturco coils was performed in 18 patients, due to persistent opacification of varices on portal venography immediately after TIPS creation.

A total of 76 Wallstents were placed in 51 patients, an average of 1. 49 (range 1 – 4) stents per patient. 59 Wallstents were placed in the initial TIPS and the remaining 17 during revisions.

The initial portosystemic pressure gradient was 23. 8 mmHg ± 7. 02(range 13 – 42) . After stent placement, mean gradient was reduced to 10. 74 mmHg ± 5. 92(range 3 – 20).

Thrombosis and restenosis of the shunt occurred in 5 (10. 41%) and 17 (35. 42%) patients, respectively, of 48 patients who were available for follow – up at an average of 16. 8 months. A total of 41 re – interventions were parformed in these patients as follows: once in 11 patients, twice in 6 patients, three times in 3 patients, four times in 1 patient and five tims in one patient. These procedures included single dilation of the shunt with a balloon catheter 19 times, dilation and placement of an additional stent 13 times, thrombolysis with Urokinase followed by thrombectomy with a Ferguson catheter 6 times, thrombolysis and restenting once, and recanulization of the shunt with a Colapinto needle due to fibrotic occlusion once. The indications for re – intervention were rebleeking (15 times), increase in ascites (6 times), decreased flow in the shunt by Doppler ultrasound (19 times) and routine angiography check (1 time) . The average interval between re – interventions was 7. 67 months + 10. 72 (range: 1 day to 31 months).

Fifteen of 16 patients with active bleeding during the procedure had immediate cessation of

the bleeding. Bleeding was controlled after thrombolysis of the shunt on one day following the initial TIPS in the other patient. All 16 patients were free of bleeding when they were discharged from the hospital on average 4.5 days after TIPS. Rebleeding occurred 17 times in 14 (29.17%) of 48 patients at an average of 8.5 months ± 12.6 (range: 1 day to 28 months), with the first rebleed at 7.94 months ± 9.30 (range: 3 day to 31 months). At time of initial discharge, ascites had decreased in 18 (60.0%) of 30 patients, increased in 8 (26.67%) and there was no obvious change in 4 (13.33%). Nine of 14 patients who had encephalopathy pre-TIPS showed improvement at 3-7 days following the TIPS, although most had mild worsening during the first 3 days. The remaining 5 patients had no apparent change or worsening.

Eleven patients (21.57%) died during the first 30 days, and 4 patients in the subsequent two months (three month mortality = 29.41%). The primary causes of death in these patients were hepatorenal failure (n = 9), acute respiratory distress syndrome (ARDS, n = 3), sepsis (n = 1), massive intraabdominal hemorrhage due to malpuncture of gastrodudenol artery during the procedure (n = 1) and pneumonia (n = 1). Nine of 15 patients were Child-Pugh C and 6 were Child-Pugh B.

Major complications occurred in a total of 15 (19.41%) patients, including one fatality (rupture of gestroduodenal artery). One was believed a malpuncture of the pericardium. This case recovered by pericardiotomy after a hospitalization for 3 weeks. Pulmonary edema developed in one patient thought to be due to migration of the stent into the right atrium. In this case, two stents were extracted using a snare and stabilizing wire inserted through both loosened sents from a right femoral vein approach on day two, Another stent was placed, and the pulmonary edema resolved. Bacterial peritonitis developed in 3 patients. A worsening clinical situation characterized by pulmonary edema, chest pain and dyspnea occurred in one case. This was thought to be due to enlargement of the shunt from 8 to 10 mm following thrombosis 8 days after the initial TIPS. When the clinical condition did not improve with medical management, the shunt was occluded 7 days after the re-intervention by inflating a 6-F Berenstein occlusin balloon catheter in the proximal shunt for 24 hours. The patient died of hepatorenal failure 2 month after the initial TIPS. The most frequent complication wes encephalopathy, which occurred in 8 (16.67%) patients who had no encephlopathy pre-TIPS.

Follow-Up

Average follow-up time was 16.8 months ± 12.8 (range: 1 day to 49 months). Twenty-three patients had died at the latest follow-up, May, 1996. The average survival time among these patients was 9.19 months ± 14.63. Hepatocellular carcinoma was found in one case 29 monts after the initial TIPS, and this patient died of heptorenal failure 18 months later after transcatheter arterial chemoembolization three times. One patient died of a parforated duodenal ulcer in 4 months after the initial TIPS. Three patients were lost to follow-up immediately after discharge. One patient underwent the liver transplantation at 9 months after the original TIPS.

The Kapal-Meier survival analysis for patients in this study is shown in Figure 1. The cumulative survival rate at 3, 6, 12, 24, 36, 48 months was, respectively, 65%, 65%, 65%, 56%, 32% and 19%. The median survival time

overall was 32.68 months . Figure 2 shows the survival time for the three Child – Pugh classes. Survival time was improved for Child – Pugh A vs. B vs. C ($P = 0.02$ by log rank test). The survival time of the patients for presentation with hemorrhage vs. ascites was also analyzed with Kaplan – Meier analysis (Figure 3), and was improved but not significantly for hemorrhage ($P = 0.103$).

Table 1 shows the results of analysis using the Cox model regression analyzing 18 factors thought to have a potential impact on 90 – day survival. The following factors correlated significantly: old age, alcoholic cirrhosis, ascties, rebleeding within one month after TIPS, smaller diameter of shunt, variceal embolization, pre – and post – TIPS encephalophthy, high post – TIPS pressure gradient, higher scores of Child – Pugh chasses, restenosis or occlusion of shunt within one minth. Gender , presentation with hemorrhage, and levitation in serum bilirubin level, serum creatinine or prothrombin time were not significant indicators. A similar analysis of two year survival was inconclusive: there was insufficient data for 9 of the 15 factors and no significant correlation for the remaining 9.

The cumulative primary patency by Kaplan – Meier analysis was 65% at 3 – 12 months, 56% at 24 months, 32% at 36 months and 19% at 48 months; assisted primary patency was 94% at 42 months, and secondary patency was 71% at 18 months.

Restenosis or occlusion occurred 41 times in 22 patients. Thrombosis occurred 6 times in 5 patients, stenosis occurred in the hepatic vein and/or proximal stent 21 times, mid – stent 9 times, and throughout the stent 5 times. Proximal stenoses were infrequent prior to 6 months, and most common at 24 – 36 months. Of mid – stent stenoses, nost were mild and occurred within one month, only one third occurred later than one year. Diffuse stent stenosis occurred at scattered times.

Table 2 shows the result of the analysis using Cox model regression for 6 factors which might predict the 180 day patencyo of the shunt. Although none of the factors showed statistical significance, short of tract and uncovered hepatic vein increased shunt diameter, single stent, low post – TIPS gradient and prolonged prothrombin time all showed a trend toward increased 6 – month patency. Data were insufficient to examine for predictors at one and two year patency.

Quality of Life

Of 24 eligible patients, completed quality of life questionaire were obtained in 19 patients (12 by mail and 7 by phone interview). Additionally, answers in 4 patients were excluded as these patients had inadequate recall of their pre – TIPS status. Two additional patients were excluded due to follow – up of less than six months, and three patients were lost to follow – up.

Average follow – up time in the 19 patients was 18.5 months + 11.37 (range: 6 – 49 months) . The quality of life scores pre – and post – TIPS are shoun in Table 3. The scores in all of the 9 concepts of health status after TIPS are higher than before TIPS. There was statistically significant improvement in the status of health change, social functioning, energy and fatigue, and emotional well – being. There were no statistically significant deference in general healty, physical function, limitation due to physical health, limitation due to emotional problems and pain. Limitation due to physical health and limitation due to emotional problems, however, were close to statistical significant difference.

Tables 4 – 6 show scores as a function of Child – Pugh class. There was an improvement in all scores for all three groups except for general health in Child – Pugh C patients, health change and pain in Child – Pugh C patents, but none were statistically significant.

The quality of life scores for patients with variceal bleeidng or ascites are shown in Tables seven and eight. The post – TIPS scores in all of the concepts but physical function in patients with refractory ascites are higher than that pre – TIPS, but agein without reaching statistical significance.

Discussion

Long – Term Survival

TIPS for the control of bleeding and short – term survival in patients with ascites or variceal bleeding is promising (1 – 5), with improved results as compared to surgical shunt or endoscopic sclerotherapy (2 – 4). However, we still know little about the impact of TIPS on long – term survival. Although sclerotherapy is effective in acute bleeding, its effect on long – term survival, as compared to medical management, remains controversial, with 2 – year survival rates of 36 – 55% and 5 – year survival of 37% (7 – 9). This is not clearly on improvement over medical mana – gement. The surgical approach relieves portal hypertension, and in one large series had a 5 – year survival rate of 62% (10). In a review of multiple series, however, Klein and Smith (11) showed an operative mortality of 7 – 40% and 1 –, 3 –, and 5 – year survival rates of 69 – 84%, 51 – 73% and 38 – 59%, respectively. In terms of long – term survival, several prior TIPS studies have suffered because of cross – over to liver transplantation that occurred with only one patient in our series.

In our study, procedural mortality was only 1.85%. The cumulative survival rates at 1 –, 2 –, 3 – and 4 – year in the patients with variceal hemorrhage was 75%, 67%, 41% and 24%, respectively, similar to the three year survival rates reported by Haskal (12). Survival rates with TIPS at one and two years, then, are comparable to those with sclerotherapy or surgery (12 – 15), but survival at theree and four years appears lower than with surgery (11). This may in part be due to exclusion of sicker patients from considiration for surgery. Child – Pugh class A patients in this study, as indirect support of this, had an 88.9% survival rate at 33 months, significantly better than class B or C patients. Also, many patients treated with TIPS were treated after failed sclerotherapy and while acutely bleeding. Nevertheless, late survival after surgery in Child – Pugh class C patients is still reported as high as 45% (16). Long – term survival, however, is clearly a complex issue. It is possible that, as suggested from prospectiye studies of sclerotherapy vs. medical therapy (9) or vs. surgery (17), long – term survival may be more a function of the disease than of the the treatment. The long – term efficacy may not be resolved in the absence of large scale, prospective controlled trials.

As shown by Fillmore (18), our study confirms that survival in patients who underwent TIPS for ascites is worse than for those with variceal hemorrhege (although this difference does not reach statistical significance [P = 0.103]). The cumulative survival time at 1 –, 2 – and 3 – year in the patients with refractory ascites in our series was 52%, 42% and 21%, respectively, which is similar to the results reported previously both with TIPS (19) and side – to – side portocaval shunts (20, 21). This surgical approach, however, which would be thought to have physiologic effects

which like those of TIPS has been essentially replaced by peritoneovenous shunts, which are more effective than medical management (22 – 24), but have not yet been directly compared to TIPS. Clearly, however, TIPS is effective in reversing diuretic refractory ascites (25), has superior survival rates than conventional medical therapy (1 – and 2 – year rates of 6%) (22), and lower procedural mortality than surgery, and thus deserves further consideration for this indication.

Long – Term Patency

Perhaps the major concerns with TIPS is stenosis of the shunt (26), reported to require revision or new shunt in up to 60% at one year and 51% at two years (13), due to recurrent bleeding. TIPS stenosis or occlusion has been shown in 21 – 58% of asymptomatic patients (27). Stenosis has been a major concern in all organ systems (TIPS, biliary, central venous, coronary, peripheral arterial) in which stents have been used. In an experimental study in pigs, Rosch reported a very high, early incidence of stent occlusion due to smooth muscle cell proliferation, a finding we have also encountered in a pig model. This may at least in part be addressed by the use of covered stents (28).

In retrospective studies, cumulative primary patency (unassisted) at one, two and three years has been reported as 58 – 69%, 40 – 49% and 12% (12, 13, 27). In prospective trials, results at six months, one year and two years were, respctively, 42%, 25% and 10% (29, 30). The results from our study are similar regarding primary patency, but we noted an increased lidelihood of restenosis, three months and two years after TIPS. No primary stenosis was noted between 3 and 18 months. With surveillance and re – dilation when indicated, assisted primary patency in our series was 94% at 42 months, and secondary patency (re – opening after complete occlusion) was 71% at the same time point. These rates confirm the effectiveness of re – intervention.

Predictors for Mortality and Patency

In examining short – and long – term patency, the sample size was too small to achieve statistical significance sufficient for all major parameters. We found that patients who died within the first 30 and first 90 days had similar causes of demise and morbidity. We therefore considered 90 – day mortality for analysis purpose. As found in other studies (14, 18, 31), age, cause of cirrhosis, active bleeding, higher Child – Pugh scores, encephalopothy and re – bleeding or restenosis within the first month after TIPS are significant predictors for 90 – day mortality.

Surprisingly, however, an eleveted serum bilirubin pre – TIPS was predictor for 90 – day survival, in contradistinction to previous reports (14, 18, 31), and inconsistent with the finding that a higher Child – Pugh classification is a significant predictor for mortality. This finding, however, may be an artifact of relatively small number. Further, total bilirubin pre – TIPS was shown in another study to be unrelated to 6 months survival (32).

Another, perhaps more relevant finding, which to our knowledge has not previously been examined, is embolization of varices at the time of TIPS as a predictor of 90 – day mortality. Although there is no obvious explanation for this finding, and it must be confirmed in other studies, it suggests that, as suggested elsewhere, it may be prudent to embolize varices only it symptomatic bleeding or ascites recur (18).

The data regarding ideal stent diameter and post – TIPS pressure gradient are not yet conclu-

sive. Valji, et al (33) described overdilation of 10 – mm stents with a 12 – mm balloon as an effective means of decreasing the gradient from 12. 7 mmHg (after 10 – mm balloon dilation) to 6. 9 mmHg. Schultz and Ring (34) suggested that in at least half of TIPS patients, the use of 12 mm stent would not improve portal decompression since hepatic and portal vein diameters were less than 10 mm. Kuhn – Fulton (35) confirming work by Hausegger (36) recently demonstrated that 10 mm Wallstents were significantly better than 12 mm Wallstents in TIPS patients both in early patency and in survival. Hausegger suggested that this was due to shortening of the stent secondary to overexpansion, whereas Kuhn – Fulton believed that comtinued recoil of 12 mm Wallstents after the procedure may have accounted for the early failure. As perhaps expected, our results suggest that shunt diameter and post – TIPS pressure gradient are significant predictors of 90 – day survival, i. e. the larger the shunt diameter and the lower the post – TIPS pressure, the better the 90 – day survival. The mean shunt diameter in patients with prolonged survival time in our series was 9. 41 mm, vs. 8. 8 mm in patients who dies within 90 days. The mean post – TIPS pressure gradient was 8. 38 mmHg in patients who survived more than 90 days, vs. 10. 58 mmHg in patients who died within 90 days. In our experience, stents were not dilated to 12 mm initially. This was only done as necessary, to reduce the gradient to less than 12 mm following stent stenosis, and was not required initially in any patients.

Quality of Life

The evaluation of any therapy with a quality – of – life tool is the understanding of patients with chronic or incurable diseases. The efficacy of a therapy must be assessed in terms not only of prolongation of life but also in terms of patient function and sense of well – being. Only several studies have evaluated quelity – of – life in TIPS patients, all 'using Karmofsky Performance Status Scale (2, 18). This is a rating scale scored by an observer or interviewer, comsisting of 3 definitions and 10 criteria, originally designed as an outcome measure in cancer patients. It has subsequently been used in other chronic diseases (37, 38). The ratings are narrowly based on physical disabilities and need for care. The disadvantages of this scale are lack of a standardized observational procedure, and its single – item scale which limits usefulness in detecting small – to moderate – differences between groups and even large differences between individual patients. It is important to use a mult – item scale including a subset of items shown to best reproduce a full – length measurement scale of proven validity (39).

The Medical Outcome 36 – Item Short – Form Healty Survey (SF – 36) developed by the RAND Corporation in the United States (39 – 41) is a self – administered questionnaire used to measure general health status and quality of life. It has applications both as a measure of outcome and in assessment of the impact of a disease on treatment on a specific population. The mult – item scale of SF – 36 is designed to achieve two well – accepted, comprehensive standards: 1) representation of multidimensional health comcepts; and 2) measurement of the full range of health status, including levels of well – being and personal evaluation of health. Most of the items of the SF – 36 are adapted from instruments that have been well – validated and that have been used for 20 to 40 years in large numbers of patients (39). It is easily completed within 5 to 10 minutes. Its reliability and validity has been verified by the

worldwide outcome application in such diverse situations as urinary tract symptoms, heart valve replacement, Hodgkin's disease, total knee replacement, dialysis, diabetes, low back pain and varicose veins. (41 – 48) . This instrument is readily available on the Intermet.

To date, the SF – 36 has not been applied to the treatment of portal hypertension. The results in the current study demonstrate that all 9 concepts related to quality of life had higher scores at a mean time of 18. 5 months after TIPS than prior to the procedure. Among them, 4 concepts (health change, social function, energy and fatigue, emotional well – being) showed a statistically significant improvement compared to before TIPS. The other concepts related to quality of life (general health, physical function, limitation due to physical health, limitation deu to emotional problem, pain) all showed improved scores after TIPS but the changes were not statistically significant. This is perhaps not surprising, both because of the limited number of patients in the study, and because TIPS does not affect the progress of the disease which causes the portal hypertension. In terms of validity of this instrument, it is interesting that the mean scores in every concept after TIPS are very close to the baseline scores of the Medical Outcome Study in 2754 patients. The reliability and validity of SF – 36 for use in detecting the quelity of life in the patients with TIPS, then, are comparable to the results in other disease status. This instrument is probably more useful than others used previously.

Overall, this study suggests that, in comparison to other treatment options, TIPS offers comparable long – term survival, and probably decreased procedural morbidity. There are several clear predictors of long – term survival and patency, including presenting symptoms, severity of hepatic dysfunction, and shunt gradient, perhaps most importantly, TIPS significantly improves quality – of – life long term, a factor which remains to be evaluated with other treatment options.

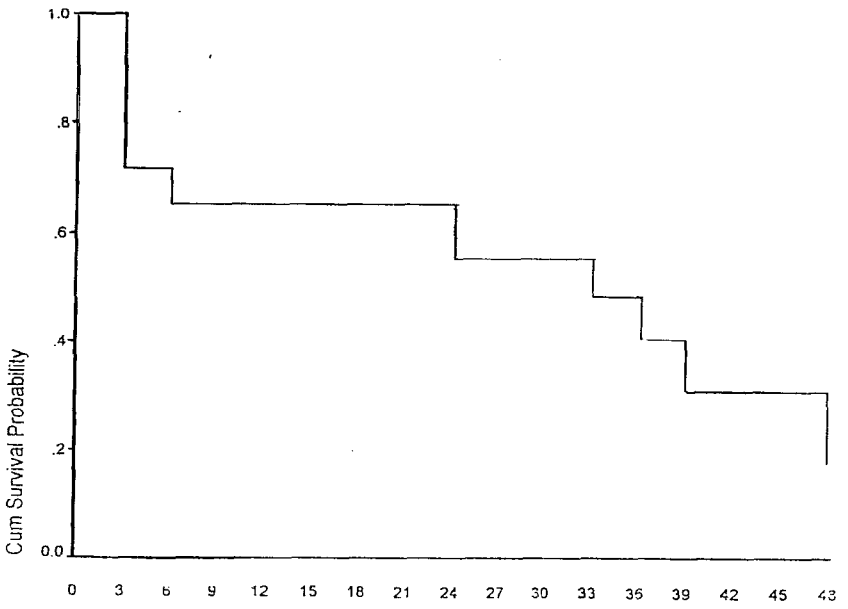

Fig. 1 Cummulative Survival Probability in Overall Patients (0. 123> SE> 0. 064)

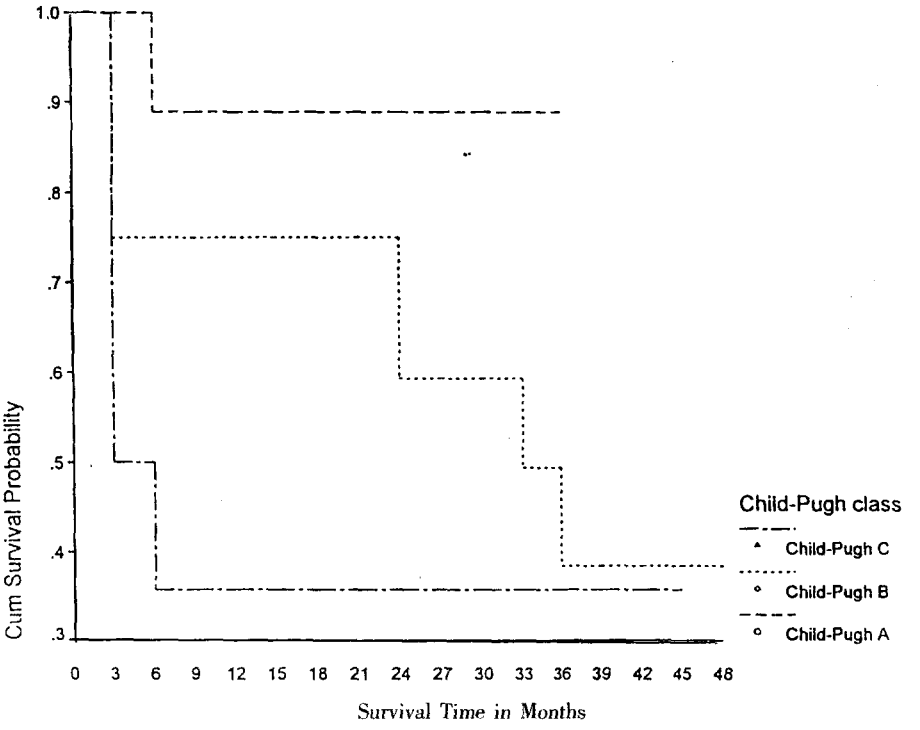

Fig. 2 Cumulative Survival Probability in correlation with Child – Pugh classes. There is significant difference among the groups (P = . 0226. log rank test. 0. 884> SE> 0. 143)

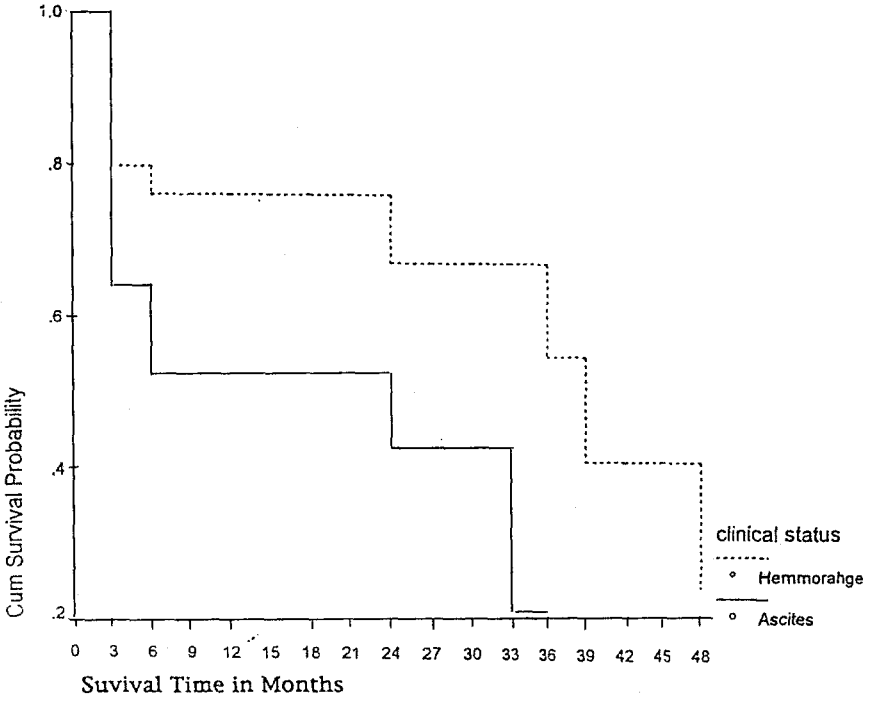

Fig. 3 Cumulative Surveval Probability in Correlation with indications for TIPS. There is no significant difference between two groups (P = 0. 103, log rank test, 0. 108> SE> 0. 165).

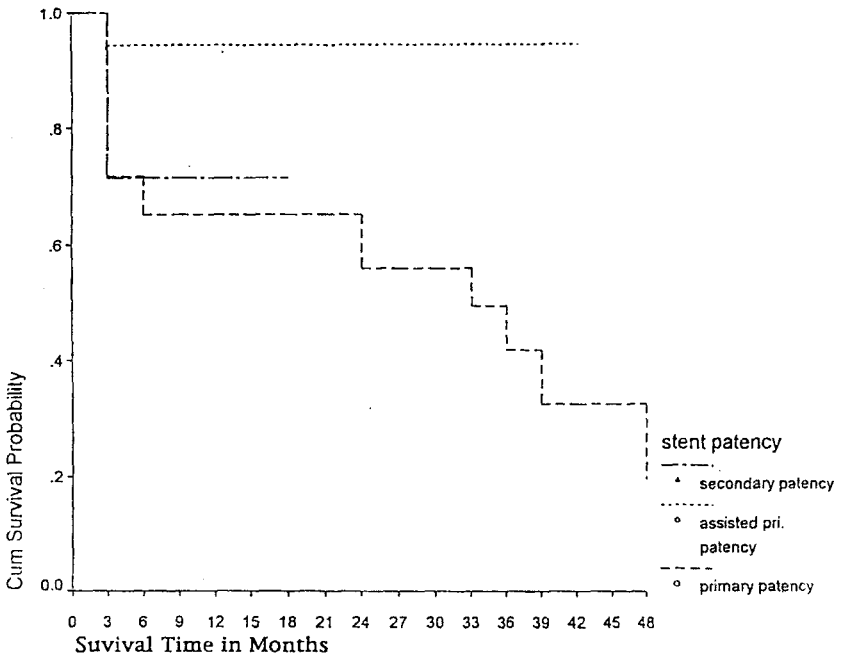

Fig. 4 Cumulative Patency Probability (0.064 <SE <0.017)

Table1. Ninty – day Survival Analysis

Variable	P Value	Regression coefficient
Age	0.0063	– 2.1133
Gender	0.0823	– 2.9897
Alcohol Abuse	0.0073	– 57.0566
Hemorrhage	0.0909	10.6304
Ascites	0.013	– 53.0393
Hemorrhage + Ascites	0.0117	– 46.1201
Active Bleeding	0.0071	– 33.9384
Child – Pugh Class	0.0097	31.763
Diameter of Shunt	0.0083	5.2425
Variceal Embolization	0.0174	– 17.93
Encephalopathy, Pre – TIPS	0.0075	– 51.4479
Gradient Pressure, Post – TIPS	0.0073	– 6.4164
Encephalopathy, Post – TIPS	0.0071	– 51.9182
Rebleeding	0.0085	– 118.9515
Restenosis or Occlusion	0.009	– 66.0517
Bilirubin Level	0.0083	6.02

Note: Rebleeding, Gradient Pressure, Encephalopathy post – TIPS, and Restenosis or Occlusion were defined within one month after the initial TIPS. Diameter of shunt indicated the diameter of the initial TIPS.

Table 2. Six – month Patency Analysis

Variables	P Value	Regression coefficient
Lenghth of Tract in the Parachyma of the Liver	0. 8847	0. 0643
Uncovered Hepatic Vein	0. 5348	0. 4506
Diameter of Shunt	0. 2224	– 0. 7802
Gradient Pressure, Post – TIPS	0. 6289	0. 0745
Number of Stent	0. 6735	– 0. 6255
Prothrombin Time	0. 4805	– 0. 1779

Note: Uncovered Hepatic vein = the length between the proximial end of the stent and IVC.

Table 3. Qualityof Life Scores in TIPS Patients

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value	MOS
General Health	19	48. 68 + 25. 38	50. 00 + 30. 25	0. 49	> . 05	56. 99 + 21. 11
Physical Funclion	19	69. 74 + 31. 91	72. 11 + 29. 07	0. 54	> . 05	70. 61 + 27. 42
Limitation due to Physical Health	19	38. 16 + 45. 16	48. 68 + 47. 49	1. 64	> . 05	52. 97 + 40. 78
Limitation due to Emotional Problem	19	52. 53 + 46. 23	59. 53 + 43. 88	1. 72	> . 05	65. 78 + 40. 71
Social Functioning	19	69. 63 + 33. 36	84. 11 + 21. 18	2. 16	<. 05	78. 77 + 25. 43
Pain	19	69. 00 + 32. 33	75. 95 + 24. 49	1. 17	> . 05	70. 77 + 25. 46
Energy and Fatigue	19	43. 16 + 21. 11	52. 63 + 30. 33	1. 92	<. 05	52. 15 + 22. 39
Emotional Well – Being	19	62. 95 + 24. 92	70/21 + 29. 58	1. 81	<. 05	70. 38 + 21. 97
Health Change	19	48. 68 + 26. 97	68. 42 + 24. 78	2. 04	<. 05	59. 14 + 23. 12

MOS: Scores of baseline of Medical Outcomes Study (N + 2471) (5).

Table 4. Quality of Life Scores in Patients with Child – Pugh A

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value	MOS
General Health	5	66. 0 + 25. 35	63. 0 + 36. 16	– 0. 86	> . 05	56. 99 + 21. 11
Physical Function	5	77. 0 + 38. 01	81 + 31. 90	1. 37	> . 05	70. 61 + 27. 42
Limitation due to Physical Health	5	80. 0 + 44. 72	80. 0 + 44. 72			52. 97 + 40. 78
Limitation due to Emotional Problem	5	80. 0 + 44. 72	80. 0 + 44. 72			65. 78 + 40. 71
Social Functioning	5	77. 4 + 31. 09	82. 4 + 39. 35	0. 77	<. 05	78. 77 + 25. 43
Pain	5	72. 0 + 36. 33	83. 0 + 21. 68	1. 22	> . 05	70. 77 + 25. 46
Energy and Fatigue	5	50. 0 + 35. 61	65. 0 + 37. 08	0. 54	<. 05	52. 15 + 22. 39
Emotional Well – Being	5	68. 8 + 31. 04	73. 2 + 34. 75	0. 93	<. 05	70. 38 + 21. 97
Health Change	5	40. 0 + 13. 69	65/0 + 22. 46	1. 8	<. 05	59. 14 + 23. 12

MOS: Scores of baseline of Medical Outcomes Study (N + 2471) (5).

Table 5. Quality of Life Scores in Patients with Child – Pugh B

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value	MOS
General Health	10	41.0 + 26.75	50.0 + 24.83	0.5	> .05	56.99 + 21.11
Physical Funclion	10	59.5 + 29.67	68.0 + 29.08	1.76	> .05	70.61 + 27.42
Limitation due to Physical Health	10	25.0 + 40.82	42.5 + 50.07	1.48	> .05	52.97 + 40.78
Limitation due to Emotional Problem	10	46.5 + 44.95	49.9 + 47.78	1	> .05	65.78 + 40.71
Social Functioning	10	67.4 + 38.67	85.2 + 26.64	1.18	<.05	78.77 + 25.43
Pain	10	63.9 + 35.26	77.1 + 26.96	1.49	> .05	70.77 + 25.46
Energy and Fatigue	10	43.5 + 32.92	49.5 + 33.04	1.29	<.05	52.15 + 22.39
Emotional Well – Being	10	66.4 + 32/08	74.0 + 27.98	1.05	<.05	70.38 + 21.97
Health Change	10	50.0 + 31.83	62.5 + 25.00	1.8	<.05	59.14 + 23.12

MOS: Scores of baseline of Medical Outcomes Study (N + 2471) (5).

Table 6. Quality of Life Scores in Patients with Child – Pugh C

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value	MOS
General Health	4	46.25 + 12.50	50.00 + 24.83	0.5	> .05	56.99 + 21.11
Physical Funclion	4	70.61 + 27.42				
Limitation due to Physical Health	4	18.75 + 23.94	25.00 + 28.87	1	> .05	52.97 + 40.78
Limitation due to Emotional Problem	4	33.25 + 47.14	58.00 + 32.03	1.57	> .05	65.78 + 40.71
Social Functioning	4	65.50 + 27.59	81.00 + 6.93	1.31	<.05	78.77 + 25.43
Pain	4	78.00 + 23.93	64.25 + 22.85	1.29	> .05	70.77 + 25.46
Energy and Fatigue	4	33.75 + 11.09	45.00 + 7.07	2.1	<.05	52.15 + 22.39
Emotional Well – Being	4	47.00 + 19.10	57.00 + 19.70	1.34	<.05	70.38 + 21.97
Health Change	4	56.25 + 31.46	62/50 + 25.00	0.24	<.05	59.14 + 23.12

MOS: Scores of baseline of Medical OUtcomes Study (N + 2471) (5).

Table 7. Quality of Life Scores in TIPS Patients with Hemorrhage

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value
General Health	11	49.55 + 22.48	52.73 + 29.35	0.35	> .05
Physical Funclion	11	76.36 + 41.30	81.36 + 29.38	1.89	> .05
Limitation due to Physical Health	11	54.55 + 45.84	70.45 + 43.07	1.47	> .05
Limitation due to Emotional Problems	11	63.55 + 45/85	66.64 + 47.16	1	> .05
Social Functioning	11	73.73 + 41.73	84.00 + 32.83	1.44	<.05
Pain	11	70.45 + 30.68	81.36 + 24.19	1.58	> .05
Energy and Fatigue	11	55.54 + 27.97	59.55 + 32.97	0.78	<.05
Emotional Well – Being	11	68.09 + 30.01	65.09 + 33.20	0.34	<.05
Health Change	11	49.55 + 24.12	65.91 + 25.67	1.34	<.05

Table 8. Quality of Life Scores in TIPS Patients with Hemorrhage

Concepts	No. cases	Pre – TIPS	Post – TIPS	t Value	P Value
General Health	8	45.00 + 30.12	46.25 + 33.14	0.18	> .05
Physical Function	8	60.63 + 20.45	59.38 + 33.90	– 0.12	> .05
Limitation due to Physical Health	8	15.63 + 35.05	18.75 + 37.20	1	> .05
Limitation due to Emotional Problems	8	37.38 + 45.15	49.75 + 37.80	1.43	> .05
Social Functioning	8	64.00 + 39.57	84.25 + 17.33	1.52	<.05
Pain	8	67.00 + 36.34	68.50 + 24.43	0.14	> .05
Energy and Fatigue	8	32.50 + 28.16	43.13 + 24.48	2.36	<.05
Emotional Well – Being	8	55.50 + 34.14	69.50 + 22.32	1.47	<.05
Health Change	8	50.00 + 29.88	71.88 + 24.77	1.51	<.05

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