A. Esophageal Stenting and related topics

1. JVIR 2009 20, 2-Supplement: S77-S78

Abstract No. 200: Management of Airway Involvement of Esophageal Cancer Using Covered Retrievable Nitinol Stents

Purpose
To assess the efficacy and safety of covered retrievable nitinol stents in esophageal cancer patients with airway involvement.

Materials & Methods
Under fluoroscopic guidance, covered retrievable nitinol airway stents were placed in 23 esophageal cancer patients with airway stricture and/or esophagorespiratory fistula (ERF) over a long period of 12 years. Six patients only had aspiration by ERF and three patients had both airway stricture and asymptomatic ERF. Technical aspects, dyspnea improvement and/or resolution of ERF symptoms, complications, reinterventions, and survival data were evaluated.

Results
A total of 27 airway stents (14 tracheal, 11 bronchial, and two hinged) were placed successfully in 23 patients with airway stricture or ERF. Dyspnea score decreased significantly after stent placement (P < 0.001). ERF were sealed off in all nine patients. Complications included stent migration or expectoration (n = 4), hemoptysis (n = 2), sputum retention (n = 7), and tumor overgrowth (n = 1). All three migrated stents were easily removed. Twenty-one patients died, with the median survival period of 76 days (range, 2 - 197 days).

Conclusion
Placement of covered retrievable expandable nitinol stents was safe and effective for the palliative treatment of airway strictures and/or ERF, with a reasonable range of complications, in patients with advanced esophageal cancer.

B. Biliary and pancreatic stenting, and related topics

2. GIE 2009 69, 2:356-360

Evaluation of hilar biliary strictures by using a newly developed forward-viewing therapeutic echoendoscope: preliminary results of an ongoing experience

Background
Obtaining a definitive tissue diagnosis in patients with hilar biliary strictures (HBS) is often difficult.

Objective
To describe our experience using a newly developed forward-viewing linear echoendoscope (FVL-EUS) with FNA as a primary diagnostic tool in patients with HBS.

Design
Case series.

Setting
A tertiary care, academic medical center.

Patients
Four patients with HBS who underwent the procedure.

Main Outcome Measurements
Performance of FNA with the FVL-EUS.

Results
Visualization and puncture of the primary lesion with a definitive tissue diagnosis was obtained in all of the 4 cases performed. Metastatic hilar cholangiocarcinoma and recurrent neuroendocrine tumor were diagnosed in 2 patients and followed by placement of a self-expandable metal stent, when possible. In the other 2 patients, a diagnosis of resectable hilar cholangiocarcinoma and poorly differentiated adenocarcinoma of unclear origin without evidence of vascular involvement was made, and plastic stents were placed before surgery; the first patient was found to have peritoneal metastases, and resection was aborted, and in the second patient, a gallbladder tumor was diagnosed in the surgical specimen.

Limitation
The small number of patients.

Conclusions
These preliminary data suggest that FVL-EUS used as a primary tool for the evaluation of patients with HBS may be of value and should be further explored in properly designed studies with a meaningful number of patients.

3
GIE 2009 69, 2:361-365
Initial experience with the prototype forward-viewing echoendoscope for therapeutic interventions other than pancreatic pseudocyst drainage

Background
The current oblique-viewing echoendoscope can occasionally be limited in its ability to perform therapeutic interventions because of the acute angle at which endoscopic accessories passed via the biopsy channel make contact with the gut wall. In an effort to overcome this limitation, a prototype forward-viewing echoendoscope was developed and successfully tested for performing transgastric drainage of pancreatic pseudocysts.

Objective
Evaluation of an initial experience with the prototype forward-viewing echoendoscope for performing interventions such as bile-duct drainage, pelvic-abscess drainage, and fiducial marker placement via the transduodenal and transrectal approaches.

Design
A retrospective study.

Setting
An academic tertiary-referral center.

Patients
Three patients.

Interventions
By using the prototype forward-viewing echoendoscope, transduodenal drainage of an obstructed bile duct, transrectal drainage of a pelvic abscess, and placement of fiducial markers in a rectal cancer were undertaken in 3 patients.

Main Outcome Measurements
To evaluate the feasibility of performing interventions via the transduodenal and transrectal approaches by using the prototype forward-viewing echoendoscope.

Observations
The procedures were technically successful in all 3 patients, and no procedural complications were encountered. The passage of accessories and the deployment of stents were technically easy with the forward-viewing echoendoscope. In addition, there was no need to reorient the position of the echoendoscope when switching from a sonographic to endoscopic view while performing therapeutic interventions.

Limitation
Small number of patients.

Conclusions
It was feasible to perform interventions such as drainage of an obstructive bile duct and a pelvic abscess, and placement of fiducial markers via the transduodenal and transrectal approaches by using the prototype forward-viewing echoendoscope. Further studies that include larger numbers of patients are needed to evaluate the role of the forward-viewing echoendoscope for performing EUS-guided therapeutic interventions.

Abstract No. 91: Use of ePTFE Covered Stents for Malignant Biliary Strictures

Purpose
Enthusiasm for bare metallic stents for malignant biliary strictures has waned due to increased rates of occlusion requiring secondary intervention. To this end, there has been greater application of covered biliary endostents for this purpose. We intend to demonstrate both patency and need for secondary interventions with the use of ePTFE covered biliary endostents for malignant biliary strictures.

Materials & Methods
Retrospective chart review was used to identify placement of 28 ePTFE covered endostents for malignant biliary strictures as palliation between May 10, 2005 and June 20, 2007. Patient records were then utilized to document patient outcome post stent placement. The Social Security Death Index (SSDI) was then used to ascertain the cause and date of patient expiry. From this, patency values were determined and Kaplan Meier curves derived.

Results
The cohort (n=28) consisted of 15 males and 13 females. The underlying neoplasm for the majority was pancreatic adenocarcinoma (25/28) with gastric, gallbladder and small cell carcinomas of the liver and pancreas comprising the remainder. The mean age at stent deployment was 65.6 years. Stent patency ranged from 11-530 days. The median patency of the biliary endostent was 126 days. From the cohort, 26 of 28 patients (93%) required no further intervention for stent occlusion. Only one patient (3%) presented with an occluded stent requiring secondary intervention after 259 days. The final patient of the cohort is currently alive with a stent patency of 586 days.

Conclusion
ePTFE covered biliary endostent for malignant biliary stricture palliation demonstrates a high primary patency rate (96%) suggesting stent patency outlives patient survival. The low secondary intervention rate (n=1, 3%) suggests the notion that palliation may be achieved satisfactorily with covered biliary endostents.
Abstract No. 92: Management of Biliary-Enteric Anastomotic Strictures After Surgical Repair of Bile Duct Injuries: Is Percutaneous Transhepatic Balloon Dilation Durable?

Purpose

Stricture formation at the biliary-enteric anastomosis is a complication after surgical repair of cholecystectomy-related bile duct injuries. Surgical revision of these strictures may be complex and has known complications. The purpose of this study was to evaluate the efficacy of percutaneous balloon dilation of iatrogenic biliary-enteric anastomotic strictures.

Materials & Methods

We performed retrospective analysis of 52 consecutive patients (32 women, 20 men, average age 52 years) referred to our institution from 1995 to 2007 for management of biliary obstruction after surgical repair (hepaticojejunostomy in 37 patients; choledochojejunostomy in 15 patients) of cholecystectomy-related bile duct injuries. Univariate analysis was used to evaluate the differences between groups of patients with successful and failed attempts of management with balloon dilation of the anastomotic strictures. No additional biliary interventions were required in the successful series of balloon dilations. Surgical revision was performed if balloon dilations were unsuccessful.

Results

28 patients were managed with balloon dilation, 19 patients went on directly to surgical revision, and 5 patients were lost to follow-up. After an average of 23 months of follow-up, biliary anastomosis were clinically patent in 15 of 28 patients (54%) treated with balloon dilation. Comparison between the groups of patients with successful and failed attempts at balloon dilation is provided in the Table 1.

<table>
<thead>
<tr>
<th>Balloon Dilation of Biliary-Enteric Anastomotic Strictures</th>
<th>Successful (N=15)</th>
<th>Unsuccessful (N=13)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of invasive procedures*</td>
<td>4.1</td>
<td>4.9</td>
<td>0.42</td>
</tr>
<tr>
<td>Number of balloon dilations*</td>
<td>1.4</td>
<td>1.9</td>
<td>0.17</td>
</tr>
<tr>
<td>Maximum balloon diameter*</td>
<td>7.1 mm</td>
<td>8.0 mm</td>
<td>0.20</td>
</tr>
<tr>
<td>Time period with indwelling biliary catheter*</td>
<td>1.8 months</td>
<td>11.2 months</td>
<td>0.02</td>
</tr>
<tr>
<td>Follow-up period*</td>
<td>24.8 months</td>
<td>24.6 months</td>
<td>0.46</td>
</tr>
<tr>
<td>Patients requiring repeat biliary drainage</td>
<td>0</td>
<td>2</td>
<td>-</td>
</tr>
</tbody>
</table>

* Values represent averages.

Conclusion

Balloon dilation of biliary-enteric anastomotic strictures after surgical repair of bile duct injuries is a durable intervention that should be considered as an initial therapy.
Purpose
To investigate the efficacy and safety of partially polytetrafluoroethylene (PTFE)-covered stents in patients with unresectable malignant biliary obstruction.

Materials & Methods
From March 2006 to Jun 2008, 33 patients were treated by placement of partially PTFE-covered stents. The stent was available in lengths of 1, 2 or 3 cm for proximal bare extension which provides intrahepatic overstenting, and in a length of 1 or 1.5 cm for distal bare extension which can preserve the orifice of the pancreatic duct. The stricture was located in common hepatic duct (CHD) in eight patients, upper common bile duct (CBD) in 10 patients, and the lower CBD in 15 patients.

Results
In all cases, the partially PTFE-covered stents were successfully placed. The bilirubin level decrease was statistically significant before and after stent placement (p < 0.001), and all patients showed clinical improvement. The thirty-day mortality rate was 9% (three of 33 patients). The mean survival and stent patency times were 251.3 days (range, 102—289 days) and 260 days (range, 165—289 days), respectively. Cumulative stent patency rate were 95.8%, 95.8%, 86.3%, and 64.7% at three, six, nine, and 12 months, respectively. Three patients (9%) presented with stent occlusion and required repeat intervention. Acute cholecystitis and pancreatitis were not observed in any of the patients. Stent migration occurred in on patient (3%).

Conclusion
Partially PTFE-covered stents are effective and safe for palliative treatment of malignant biliary obstructions.

C. Colorectal stenting and related topics

Surgical Outcome and Long-Term Follow-Up after Segmental Colorectal Resection in Women with a Complete Obstruction of the Rectosigmoid due to Endometriosis

Introduction:
Intestinal involvement is reported in up to 12% of women with endometriosis. Complete large bowel obstruction is a rare complication of intestinal endometriosis. It is estimated to occur in less than 1% of the cases. Objective: The aim of this study is to evaluate the surgical outcome and long-term follow-up after segmental colorectal resection in women with a complete obstruction of the rectosigmoid due to endometriosis. In addition, the diagnostic work-up is described and discussed in view of the current literature. Patients and Methods: We present a case series of 5 patients with a complete obstruction of the rectosigmoid due to endometriosis who were finally treated in our hospital within a multidisciplinary endometriosis team. We retrospectively analyzed all patients with this condition who were referred in the period January 2000 to December 2006.

Results: All patients (mean age 31.8 years, range 25-43 years) underwent emergency surgery resulting in a diverting colostomy before referral to our hospital. The principal diagnostic tool used was magnetic resonance imaging which demonstrated in all patients multiorgan endometriosis with complete obstruction of the rectosigmoid. Thereafter, all patients underwent a segmental colorectal resection by re-laparotomy. The diagnosis intestinal endometriosis was histologically confirmed in all cases. After surgery no major complications occurred. During a follow-up of 18-36 months, residual symptoms such as chronic constipation, deep dyspareunia and chronic pelvic pain were reported in 2 patients. No recurrences of intestinal endometriosis occurred. Conclusion: In our case series, segmental colorectal resection showed a favorable surgical outcome with no major complications. In the long-term follow-up, a limited number of residual symptoms were reported and no recurrences occurred. Intestinal endometriosis as a cause of bowel obstruction is often a diagnostic challenge mimicking a broad spectrum.
of diseases. It should be included in the differential diagnosis in women of reproductive age presenting with any symptoms of bowel obstruction. Magnetic resonance imaging is recommended as the primary imaging technique in such cases. In our opinion, these patients should be treated in a multidisciplinary setting.

Abstract No. 100: Colo-Rectal Self Expandable Metallic Stents. A Multicentric Experience

**Purpose**

The aim of this work was to evaluate the clinical efficacy and associated morbidity in the treatment of colo-rectal obstruction, either as a palliative definitive treatment or as “bridge to surgery”.

**Materials & Methods**

From October 1995 to August 2008, 99 self expandable metallic stents were inserted in 87 pts. Twenty-one of them were positioned in emergency and 8 as bridge to surgery. Placement of the stent was always performed under fluoroscopic control alone. The site of the obstruction was the sigmoid colon in 40 pts, the rectum in 21, a colo-rectal anastomosis in 11, a colo-colic anastomosis in 7, the transverse colon in 4, the left colon in 3. The nature of the obstruction was adenocarcinoma in 56 pts, anastomotic recurrence in 17, cicatricial in 5, other neoplasms in 4, post-radiotherapy in 3, ischemic in 2. The positioned stents were 36 Ultraflex Precision, 19 Memotherm, 17 enteral Wallstent 17, others 27.

**Results**

Stent placement was technically successful in 82/87 pts (94.2). 12 pts required the positioning of two stents (10 due to the length of the stenosis, 2 to malpositioning of the stent.) Unsuccessful positioning was due to early migration in two pts, and impossibility to reach the obstruction, coexisting colo-enteric fistula and failed expansion in the others. Recanalization was achieved in 80/87 pts (91.9%). There were 3 major complications: 2 recto-vesical fistulas respectively 15 and 3 months after positioning (both in pts who underwent radiotherapy) and incontinence in one. Stent migration occurred in 5 pts and bleeding in 4, perforation or obstruction in none.

**Conclusion**

Stenting is effective in providing colo-rectal patency and it should be considered as a first-line palliation for inoperable malignant strictures and as bridge to surgery in critically occluded patients. The radiological approach is much less invasive than the endoscopic one, better tolerated and much safer due to the panoramic vision of fluoroscopy. Moreover poor colonic toilette is not a problem for the radiological approach. In conclusion, in our experience, the treatment of colo-rectal obstruction with expandable stents performed under fluoroscopic control alone is safe and effective, with a low complication rate.

D. TIPS Stenting and related topics

**TIPS: Comparison of Shunt Patency and Clinical Outcomes between Bare Stents and Expanded Polytetrafluoroethylene Stent-Grafts**

**Purpose**

To compare shunt patency and clinical outcomes in two groups of patients who received a transjugular intrahepatic portosystemic shunt (TIPS): one group with bare stents and one with expanded polytetrafluoroethylene stent-grafts.
Materials and Methods

TIPS were created with bare stents (n = 41) or stent-grafts (n = 40). Overall TIPS patency rates were compared between these two groups, as were clinical outcomes in patients with variceal bleeding and those with ascites.

Results

In the bare stent group, primary shunt patency rates were 63%, 48%, and 24% at 3, 6, and 12 months, respectively. Secondary patency rates were 75% and 62% at 3 and 6 months, respectively. In the stent-graft group, primary patency rates were 94%, 67%, and 38% at 3, 6, and 12 months, respectively. Secondary patency rates were 100% and 92% at 3 and 6 months, respectively. All stent patency rates were higher in the stent-graft group, but only the difference in the 3-month primary patency rate (63% vs 94%) reached significance (P = .03). In patients with variceal bleeding as well as those with ascites, early and overall clinical success rates were higher in the stent-graft group, but only the 3-month and 12-month differences were statistically significant.

Conclusions

TIPS created with stent-grafts had better 3-month primary patency rates and better 3-month and 12-month clinical success rates compared with those created with bare stents.

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JVIR 2009  20, 2-Supplement: S78-S79

Abstract No. 203: Effect of Transjugular Intrahepatic Portosystemic Shunt (TIPS) Placement on Renal Function: Seven Year, Single Center Experience

Purpose

Hepatorenal syndrome often complicates chronic liver disease and can be refractory to medical management. TIPS has been shown to be beneficial for renal function in small series of patients with hepatorenal syndrome. We examined the effect of TIPS placement on renal function in a large series of patients undergoing TIPS for portal hypertension with varying degrees of baseline renal insufficiency.

Materials & Methods

We retrospectively reviewed all TIPS placements between 1/1/2001 and 10/10/07 including 201 successful TIPS procedures, regardless of indication. Revisions, failed procedures and reverse TIPS were excluded. Patients who presented with ESRD on dialysis were excluded. Preprocedure creatinine (Cr) measurements as well as bilirubin and INR were obtained to calculate a MELD score. GFR was calculated with the MDRD equation. Pre- and post-TIPS portosystemic gradients were obtained from procedure reports. Follow up repeat laboratory values were obtained at discharge, first follow up appointment, or next admission with a mean follow up time of 50 days. Subanalysis of patients with mild or severe renal insufficiency (Cr 1.2-1.9 or >2.0 mg/dL) was performed. The change in Cr and GFR were analyzed with a student's t-test.

Results

A total of 129 cases of TIPS were included (mean age 54.5, M:F 1:8). Mean pre- and post-procedure portosystemic gradients were 18.4 and 7.6 mmHg. Overall, the mean pre- and post-procedural creatinine measurements decreased from 1.4 to 1.0 (p<10 &emsp;9), whereas corresponding MELD scores increased from 15.2 to 16.2 (p=0.005). The GFR improved from a mean 66.3 to 86.3 mL/min/1.73 m2 (p<10 &emsp;10). Patients with preprocedure Cr between 1.2 -1.9 (n=44) improved from a mean of 1.5 to 1.1(p<10 &emsp;11) and patients with preprocedure Cr >2.0 (n=22) improved from a mean of 2.7 to 1.4(p<10 &emsp;5).

Conclusion
TIPS improves underlying renal dysfunction in chronic liver disease. Patients with severe renal dysfunction benefit the most from TIPS.

Abstract No. 204: Percutaneous Sonographic Guided Direct Simultaneous Puncture of the Portal Vein and Inferior Vena Cava for TIPS in Budd-Chiari Patients

Purpose
Budd-Chiari syndrome (BCS) is an uncommon liver disease defined as an obstruction to hepatic venous outflow at any level from the small hepatic vein to the junction of the inferior vena cava and the right atrium. Depending on the level and extent of venous occlusion, and its rate of development, the clinical presentation can vary from ascites, abdominal pain and hepatomegaly to more serious problems such as hepatic failure and encephalopathy. Transjugular intrahepatic portosystemic shunt (TIPS) have been shown to be an efficient treatment for BCS patients uncontrolled by medical therapy. We present our experience using percutaneous sonographic guided direct simultaneous puncture of the portal vein and the inferior vena cava to place a TIPS in patients with BCS.

Materials & Methods
Between May 2006 and September 2007, TIPS was performed using percutaneous sonographic guided direct simultaneous puncture of the portal vein and inferior vena cava in 16 Budd-Chiari patients (10 women and 6 men ranging in age between 18-38 years). Indication for the TIPS procedure was intractable ascites in all patients.

Results
Technical success was achieved in all patients with reduction of mean porto-systemic pressure gradient from 21 to 5.2 mm Hg. The cumulative rate of primary patency was 62.5% at 1 year. While rate of assisted patency after re-intervention was 93.75% at 1 year. Seven re-interventions were performed in six patients. In only one patient the shunt was re-occluded after re-intervention twice and the patient was referred to surgery department. In 13 of the 16 patients ascites resolved completely, and in two patients it was relieved and patients were satisfied by the results and continued on diuretic therapy, only one non-responding patient was referred to surgery after failure of re-intervention. So our clinical success rate was 93.75%.

Conclusion
Excellent technical and clinical success can be achieved with percutaneous sonographic guided direct simultaneous puncture of the portal vein and inferior vena cava in patients with BCS.


Purpose
PVS is a rare (1%) but ominous complication of liver TX. Percutaneous treatment with PTA, PTA and stenting with balloon expandable stents and Wallstents was described. We are reporting our experience with Nitinol stents for PVS.

Materials & Methods
3 liver transplant patients with PVS (average time from TX 11.6mo, range 2-17mo) were treated. Two patients were diagnosed with high grade stenoses on surveillance US while third patient was diagnosed with PVS complicated by thrombosis. All 3 cases
were done with GA. Percutaneous 6F access to R PV was obtained. Primary stenting using 14mmx40mm Nitinol stent with PTA to 10mm was performed in nonthrombosed cases. Thrombosed PV was treated with Power Spray Retavase Lysis followed by stenting also with 14mmx40mm Nitinol stent with PTA to 10mm. Access tracts were embolized using Gianturco Coils. There were no complications. Follow up consisted of US every 3-6months. All 3 PVs remain thrombosis free (average time from stenting 20months, range 6 to 38month).

Teaching Points
Use of Self expandable National stents for treatment of post liver TX PVS is feasible, allows for use of relatively small (6F) delivery system with a large diameter of the stent required by PV. Complications are rare with good longevity.

Abstract No. 362: Transjugular Intrahepatic Portosystemic Shunt: Comparison of Right Versus Left Jugular Access for Hepatic and Portal Vein Cannulation

Purpose
To review the complications, technical failure rate and anatomy comparing the right and left jugular approach for transjugular intrahepatic portocaval shunts.

Materials & Methods
One hundred fifty-four attempted TIPS at the University of Michigan Department of Radiology were identified from January 1, 2004 to October 1, 2008. Out of these 154 procedures, 53 were performed from a left jugular approach, 99 used a right internal jugular approach, and 2 used alternative approaches. Procedural complications and 30 day morbidity including liver failure and death were collected for both groups.

Results
One hundred forty-eight of the 154 total procedures resulted in successful creation of a TIPS. All of the 6 unsuccessful procedures used a right internal jugular approach. On a second attempt, two were successful one with a right internal jugular approach and the other using the left internal jugular approach. Procedural complications were not significantly different between the left and right internal jugular approaches. One hundred twenty-one of the 154 procedures were performed by the three physicians with the highest TIPS volume over this period. These three physicians performed 52 of the 53 left internal jugular TIPS procedures and had only one unsuccessful TIPS placement. The remaining 33 procedures were performed by 7 different physicians and had 5 unsuccessful TIPS placements. We reviewed available multi-planar MRI and multi-phase CT images for the unsuccessful TIPS placements and compared them to the successful placements. There was no significant difference in the sagittal and coronal angulation of the hepatic veins or the relationship of the right hepatic and right portal vein.

Conclusion
There are potential technical advantages of a left sided jugular access site which include a possible straighter course from a left jugular access site to the preferred targeted site of portal vein. In our series, the complication rate for a left jugular approach is similar to a right jugular approach, while the technical failure rate is lower with higher physician TIPS procedural volume and left jugular approach.

JVIR 2009  20, 2-Supplement: S134

JVIR 2009  20, 2-Supplement: S136
Abstract No. 367 EE: Early Dysfunction of Transjugular Intrahepatic Portosystemic Shunts (TIPS): Etiologies and Management

Purpose

Various complications may occur at any time in patients with Transjugular Intrahepatic Portosystemic Shunts (TIPS). Some result from progression of the underlying liver disease, while others may be attributed to either issues with the shunt or extrahepatic processes such as competing physiologic shunts, hypercoagulable states, etc. Complications that are unrelated to intrinsic liver disease may result in early TIPS failure, defined as shunt dysfunction occurring within the first 30 days of TIPS creation. The shunt may be salvaged in this period if the etiology for failure can be demonstrated. We describe and illustrate, with clinical examples, the causes, imaging manifestations and various treatment options for managing early TIPS dysfunction.

Materials & Methods

We present representative cases of early TIPS dysfunction that have either resulted in recurrent or new clinical symptoms, or in which significant abnormalities have been noted on surveillance imaging that are predictive of impending shunt failure. Management options for salvaging failing shunts are discussed and illustrated with clinical and imaging examples. The anatomic considerations, reintervention options, success rates and long-term shunt patency following reintervention, as well as the complications and potential management pitfalls are illustrated and discussed. Initial post-TIPS management strategies and surveillance imaging protocols and their role in predicting early shunt dysfunction are described.

Teaching Points

Despite initial technical success in TIPS creation, these shunts are susceptible to various causes for failure. Some of these may occur in the first 30 days of TIPS creation, and if recognized and treated, may allow for shunt salvage. Causes for early shunt dysfunction include in-stent neointimal hyperplasia, inadequate stent length, competing physiologic shunts, pre-existing main portal vein thrombosis, acute stent angulation, TIPS thrombosis and an overly efficient shunt causing encephalopathy or hepatic failure. Management of early TIPS dysfunction typically requires reintervention. Surveillance imaging following TIPS creation is often useful in predicting impending shunt failure and directing appropriate therapy.

E. Endovascular peripheral stenting and related topics

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JVIR 2009 20, 2:192-202

Assessment of the Vessel Lumen Diameter and Degree of Stenosis in the Superficial Femoral Artery before Intervention: Comparison of Different Algorithms

Purpose

To determine which angiography-based algorithm delivers the most precise results in comparison with direct measurements at intravascular ultrasonography (US) and evaluate their influence on the resulting balloon size for treatment.

Materials and Methods

Thirty patients with untreated superficial femoral artery stenosis underwent digital subtraction angiography (DSA) and intravascular US before intervention. Two experienced radiologists measured twice the native vessel lumen diameter and the degree of stenosis with all algorithms and modalities in a predefined vessel segment that was perceived to be unaffected. On the basis of the measurements of the vessel lumen diameter, a suitable balloon size for treatment of the lesion was calculated.

Results

The mean vessel diameter was 5.7 mm for intravascular US, 6.6 mm for caliper calibration, 6.0 mm for calibration of the catheter tip, and 4.7 mm for visual estimation. Selected balloon sizes were 6.0 mm, 7.0 mm, 6.0 mm, and 5.0 mm,
respectively. The mean percentage of stenosis was 78.8% for intravascular US, 81.6% for caliper calibration, 79.7% for catheter calibration, and 88.8% for visual estimation. Intermethod correlation was best for intravascular US and calibration of a catheter tip (0.881, P < .0001).

Conclusions
Measurements on DSA equipment calibrated to a catheter tip correlate best with direct intravascular measurements. Visual estimation can lead to underestimation of the true vessel size and overestimation of stenosis.

Abstract No. 26: Percutaneous Stenting across IVC Filters During Recanalization and Reconstruction of Chronic IVC and Iliac Vein Occlusions in 15 Symptomatic Patients

Purpose
Chronic occlusions of the IVC and iliac veins can be very symptomatic. Filters can cause or contribute to the IVC thrombosis. Many of these filters are not designed to be retrieved, or are not amenable to retrieval. We describe recanalization and reconstruction of chronically occluded IVC and iliac veins in 15 patients with indwelling permanent or non-retrievable IVC filters.

Materials & Methods
Between February of 2004 and September 2008, 15 patients with chronic occlusions of the IVC and iliac veins underwent percutaneous stenting across non-retrievable IVC filters. The age range of the patients was 26 - 68 years. 14 patients had IVC filters in place, and 1 had bilateral common iliac filters in place. 8 had superimposed Gianturco Z-stents placed within Wallstents across or through the IVC filters. The outer Wallstent, is reinforced with the radial strength of the Z-stents, and prevents the retention hooks from perforating. 9 required extending the iliac stents into the common femoral vein to reinitiate inflow, and one had a CFV patch.

Results
All 15 patients had successful stenting of occluded IVC and iliac vein segments. There were no IVC ruptures. Follow-up is unavailable on 6 patients. Follow-up demonstrated persistent clinical improvement, and patency of the stents at 162 - 1,028 days. One that initially had stenting of the IVC and left iliac vein, presented seven weeks later with thrombosis of the right right iliac vein. This was stented following thrombolysis. The IVC and left iliac vein stents remained patent. One patient had thrombosis of both stented iliac veins 474 days after the procedure, and required thrombolysis and extension of both common iliac vein stents. There were no mortalities, with one significant groin complication requiring surgical repair.

Conclusion
Despite the presence of non-retrievable IVC filters associated with the chronic IVC occlusion, successful deployment of stents across or through the IVC filter, displacing it out of the way, can lead to successful re-establishment of flow and improvement in symptoms.