Endovascular treatment of SVC syndrome from neoplastic origin: a review of 34 cases

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Résumé
Traitement endovasculaire du syndrome cave supérieur d’origine néoplasique : à propos de 34 patients
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Objectifs. Exposer nos résultats du traitement par endoprothèse Wallstent de 34 syndromes caves supérieurs (SCS) d’origine néoplasique.

Matériels et méthodes. Trente-quatre patients ont été traités de janvier 2000 à février 2007 : Vingt-un hommes et 13 femmes, âgés de 44 à 81 ans affectés de 27 cancers bronchiques non à petites cellules (79 %), 5 cancers bronchiques à petites cellules (15 %) et 2 cas de métastases médiastinales d’adénocarcinome mammaire (6 %). Tous les patients ont été traités par endoprothèse Wallstent auto expansible en acier. Un double abord veineux fémoral et brachial était systématique.

Résultats. Le stenting a pu être effectué dans tous les cas. 2 cas de détresse respiratoire aiguë sont survenus en cours de procédure : un œdème aigu pulmonaire (OAP) et une tamponnade. La résolution des symptômes était constante en moins de 24 heures. Vingt-six patients sont décédés de l’évolution de leur maladie, huit durant le premier mois et 16 autres après 32 à 545 jours (moyenne : 213,4 jours). Cinq cas de récidive du SCS (19 %) étaient traités par un deuxième geste (trois resténoses, une fracture, une thrombose), soit des perméabilités primaires et assistées de 81 et 100 %.

Conclusion. Le traitement palliatif par stent du SCS néoplasique, profitable en terme de qualité de vie, est fiable, sûr et pérenne.


Abstract
Purpose. To report our experience with the treatment of 34 patients with SVC syndrome from neoplastic origin using the Wallstent.

Materials and methods. Thirty-four patients were treated between January 2000 and February 2007: 21 males and 13 females, aged 44-81 years, with non-small-cell lung carcinoma in 27 cases (79%), small-cell lung carcinoma in 5 cases (15%) and metastatic breast adenocarcinoma to the mediastinum in 2 cases (6%). All patients were treated using the stainless steel self-expanding Wallstent. A dual brachio-femoral access was used in all cases.

Results. Stent placement was possible in all cases. Per procedure acute respiratory distress occurred in 2 cases: 1 case of acute pulmonary edema and 1 case of tamponade. Symptoms resolved within 24 hours. Twenty-six patients died from disease progression, 8 during the first month, and 16 within 32-545 days post-procedure (mean: 213.4 days). Five patients with recurrent SVC syndrome underwent repeat treatment (restenosis in 3 cases, fracture in 1 case, thrombosis in 1 case), for primary and secondary patency rates of 81% and 100%.

Conclusion. Palliative stent treatment of neoplastic SVC syndrome is reliable, safe and provides long-standing improvement in quality of life.

Key words: Superior vena cava syndrome. Endovascular therapy. Endoprosthesis. Stent. Bronchogenic carcinoma.
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and may not provide visible improvement before 6-10 days (4). The use of platinum salts for chemotherapy (small cell lung carcinoma) requires diuresis and hydration and prompt resolution of the SVC obstruction.

Since it was first reported by Charnsangavej, et al. (5) in 1986, SVC stenting in patients with malignant SVCS is viewed by many authors as a treatment modality of choice (6). The percutaneous approach offers many advantages compared to more traditional therapies, especially with regards to its feasibility and near immediate symptomatic improvement. While the procedure is fairly standardized (7), catheter and stent selection remain variable given the continuing improvements in angiographic techniques and devices. The purpose of this paper is to summarize our experience in the management of malignant SVCS using one or more self-expanding metallic stents.

Materials and methods

Patients

Between January 2000 and February 2007, 34 patients with SVCS were treated in our facility. There were 21 males and 13 females. The mean age was 60.5 years (range: 44-81 years). SVCS was the presenting feature of malignancy in 18 cases, while the 16 others had known malignancy. At the time of stenting, definitive histological diagnosis was available in 30 cases, whereas diagnosis was confirmed afterwards on mediastinoscopy in the last 4 cases. Early treatment of the SVCS was considered important by the multidisciplinary team for those 4 cases. All cases of SVCS were malignant, including 27 cases (79.4%) of non small cell lung carcinomas (NSCLC) (13 squamous cell carcinomas, 10 adenocarcinomas, 4 large cell carcinomas), 5 cases (14.7%) of small cell lung carcinomas (SCLC), and 2 cases (5.9%) of mediastinal invasion by lung metastases from breast carcinoma. Clinical data and results from our patient population are summarized in table I.

The indication for stenting was made in all cases after review by a multidisciplinary team. Placement of the venous endoprosthesis was based on review of a chest CTA (fig. 1) and confirmed by superior vena cavography performed immediately prior to stenting. Chest CTA with multiplanar reconstructions allowed planning of the procedure by depicting the site, extent and cause of the occlusion or stenosis and the presence of associated thrombosis.

Procedure (fig. 2)

All procedures were performed under local anesthesia with conscious sedation using sufentanil (Sufenta®). They were performed in the angiography suite under sterile technique with radiation protection procedures. A Siemens MultiStar TOP angio unit was used, allowing rapid acquisition of high resolution images. Automated digital measurements from subtracted images were obtained to evaluate the degree and length of stenosis. Pressure measurements in the right heart chambers and SVC were not obtained. The need for deeper sedation was assessed by an on-site anesthesiologist based on patient tolerance, respiratory rate and level of awareness. Oxygen saturation, heart rate, blood pressure, and EKG were under continuous monitoring.

A dual-access or telepheric venous approach was attempted in all cases, usually right femoral and brachial. This technique allows straightening of the wire from both ends, facilitating placement of the endoprosthesis across the stenosed segment. Using 4F sheaths (Terumo, Tokyo, Japan) at the arm and 9F or 10F sheaths (Terumo, Tokyo, Japan) at the femoral vein depending on the size of the endoprosthesis, we have performed 26 procedures with dual right femoral and brachial access, 3 with dual right humeral and left femoral access after failure of right femoral vein puncture, and 5 with single right femoral access after failure of puncture at the right and left upper extremities.

The occluded segment(s) were distributed as follows: SVC only: 61.7%, SVC and right brachiocephalic vein: 20.5%, SVC and right and left brachiocephalic veins: 11.8%, SVC and right brachiocephalic and subclavian veins: 3%, right brachiocephalic and subclavian veins: 3%.

All stenoses and occlusions were stented using Wallstent endoprostheses (Boston Scientific, Natick, USA). Stent length

Fig. 1: Contrast material enhanced chest CT: axial image through the arch vessels and SVC. SCLC causing SVCS without associated thrombosis. CT showing SVC compression and its relationship to the arch vessels and right atrium.
and diameter were selected based on data from CTA and pre-stenting cavogram. The initial selection may sometimes prove insufficient, requiring a second if not a third stent. The length of the stented segment ranged from 30 to 100 mm, in order to entirely cover the length of the obstructed segment. The diameter was based on the normal SVC diameter measured away from the obstruction. Generally, diameter varied between 12-16 mm and length between 6-12 cm. Stent diameter was also selected based on diameter variations during the respiratory cycle. We have placed a total of 47 stents in 39 procedures, including 34 initial placements, and 5 repeat stenting. The most frequently used stent was the 16 × 60 mm Wallstent.

A brachial venous access allowed opacification proximal to the area of obstruction prior to passage of a wire across the obstruction, typically a hydrophilic 0.035-inch Terumo J wire (Terumo, Tokyo, Japan) from a brachial or femoral approach based on the configuration of the lesion. The use of a straight 5F multiple sidehole catheter (Biosphère Médical, Roissy, France) for cavography allowed opacification across the lesion for optimal characterization of the pathological segment. Once a wire was across the lesion, it was replaced by a more rigid wire such as Terumo Stiff (Terumo, Tokyo, Japan) or Amplatz Super Stiff (Boston Scientific, Natick, USA) with both extremities that could be used to make the wire rigid from each access site after lasso retrieval (Goose Neck EV3, Plymouth, USA). The right femoral

<table>
<thead>
<tr>
<th>N°, Sex, Age (years)</th>
<th>Histology</th>
<th>Stage at the time of stenting</th>
<th>Site of obstacle</th>
<th>Wallstent Nb, D × L (mm)</th>
<th>Survival after stenting (days)</th>
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<tbody>
<tr>
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<td>6, F, 72</td>
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<td>SVC</td>
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<tr>
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<td>IDC</td>
<td>Rt BCV, SVC</td>
<td>3: 16 × 60 (2), 16 × 40</td>
<td>alive</td>
</tr>
<tr>
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<td>III b</td>
<td>SVC</td>
<td>2: 14 × 60 (2)</td>
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<td>alive</td>
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<td>1: 14 × 70</td>
<td>41</td>
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<td>SVC</td>
<td>2: 14 × 70, 16 × 70</td>
<td>162</td>
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<td>SVC</td>
<td>1: 18 × 40</td>
<td>258</td>
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<td>IV</td>
<td>SVC</td>
<td>2: 14 × 60 (2)</td>
<td>30</td>
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</table>

SCLC small cell lung carcinoma; SVC superior vena cava; BCV brachiocephalic vein; SCV subclavian vein; IDC invasive ductal carcinoma. Wallstent: number and size (diameter × length in mm).
approach allowed placement of one or multiple Wallstents via a 9F or 10F guide catheter (Terumo, Tokyo, Japan) depending of stent diameter. At the time of stent deployment, the superior marker was placed proximal to the occluded segment to anticipate stent shortening after release. The possibility to re-sheath the stent prior to complete deployment allowed repositioning if needed. Stent placement at the desired location was facilitated by the use of osseous landmarks and radiopaque markers. Contrast could also be injected via a catheter placed proximal to the lesion. When two stents were required to cover a lesion, attempts were made to treat the superior end of the lesion first. Pre-stent dilatation using a low pressure balloon angioplasty catheter was not always performed. However, post stenting balloon angioplasty using an OPTA PRO system (Cordis, Europa, The Netherlands) was always performed with one or multiple catheters to allow complete stent expansion. The balloon diameter was slightly inferior to the SVC (1-2 mm less); the balloon was generally shorter than the stent. Post stenting cavogram was obtained in all cases, first with wire in place, then after wire removal, to confirm adequate recanalization of the SVC. Treatment was considered successful when the stent was in adequate position, patent, and that collaterals were either no longer visible or markedly decreased. Twenty-one patients with SVC occlusion received an intravenous bolus of 3000-5000 units of heparin, based on weight, prior to stenting. In situ thrombolysis with ACTILYSE® (rtPA, 20 mg) was performed in one case, and mechanical clot aspiration was performed in three cases using a standard angiography catheter. While thrombolysis may, in patients with significant clot burden, reduce the length and number of required stent(s), it may also increase the risk of hemorrhagic complication, which may be relevant in patients with metastatic disease. Patients without occlusion did not receive anti-coagulants. Hemostasis at the puncture sites was achieved with manual compression. Compression bandages were removed after 6 hours, and patients were instructed to maintain bedrest for 24 hours to avoid hemorrhagic complications. Heparin was given for 48 hours to maintain an ACT between 2 and 3 times compared to the control, and a VKA was used to maintain an INR between 2 and 3 for one month. Aspirin was started the day of the procedure (ASPEGIC® 125 mg/day). At one month, the VKA was discontinued, and aspirin was continued for 6 months (ASPEGIC® 125 mg/day). In patients with significant hemorrhagic risk, aspirin was introduced at one month, after the VKA was discontinued. No patient received antibiotics prior to or during the procedure.

**Follow-up**

Patients were admitted for at least 24 hours after the procedure and puncture site(s), vital signs and temperature were routinely recorded. A chest CT was obtained 8 days after stenting to confirm patency and adequate position of the stent, resolution of collateral flow, and detect

**Fig. 2:** SVC stenosis in a 44 year old man with SCLC.

- **a** Right brachial injection showing an irregular SVC stenosis.
- **b** Opacification across the lesion from a multi side hole catheter provides optimal evaluation of the pathological segment.
- **c** Stent deployed in the SVC. The brachiocephalic confluence is preserved.
- **d** Cavogram with guide catheter in place confirms SVC patency.
- **e** Final venogram, after guide catheter withdrawal.
the possibility of intrastent thrombus (Fig. 3). Follow-up angiography was only performed in patients with recurrent SVCS prior to repeat stenting.

Results

Short term results

In 26 patients, a single Wallstent endoprosthesis was necessary. In 7 cases, 2 Wallstents were initially placed. In one case, 3 Wallstents were placed in the right subclavian vein, right brachiocephalic vein and SVC. Bilateral brachiocephalic vein stenting was not performed in patients with bilateral occlusion.

The lesion could be crossed and the stents deployed in all cases, for a rate of technical success of 100%.

Stent deployment with restoration of SVC patency resulted in resolution of SVCS symptoms for all patients within 24 hours, for a rate of clinical success of 100%, with regression of cervicofacial edema, improvement of dyspnea, and headaches.

Stent migration did not occur. No technical complication at the stenosis site or puncture site(s) was recorded. Acute respiratory distress at the end of the procedure occurred in 2 cases (2/34; 5.8%), requiring acute management, with good clinical outcome: acute pulmonary edema in one case and pericardial tamponade in the other case.

Acute onset of respiratory distress during SVC angioplasty procedures is unusual and should raise concern for acute pulmonary embolism. Eight patients (23.5%) died during the first month, including 4 within the first 8 days after the procedure, in spite of restored patency of the SVC. Deaths were attributed to the underlying malignant disease.

Long term results

Follow-up was available for 26 patients. Mean follow-up was 213.4 days (32-545 days), or just a little over 7 months. Eight patients (8/34, 23.5%) were alive and being treated or followed-up for their neoplastic disease at the end of the follow-up period (1-44 months, mean of 12.3 months). Two of these 8 patients had a survival superior to 2 years (26 and 44 months), without SVCS recurrence, explaining the high mean survival of this subgroup of patients. Both patients were treated for SVCS due to mediastinal extension of breast carcinoma, which was until then in remission (mean survival for this pathology is usually superior to that of patients with lung carcinoma).

Recurrent SVCS was observed in 5/26 cases (19.2%), all successfully treated with repeat endovascular treatment. One case was due to stent fracture at 6 months and treated with placement of a second stent. Three cases were due to intrastent tumor growth at 2, 4 and 21 months respectively and treated with placement of a second stent. The last case was due to intrastent thrombosis at 2.5 months and treated by angioplasty alone.

Primary and secondary patency rates were of 21/26 (81%) and 26/26 (100%) respectively.

Discussion

Vascular access

The femoral approach provides comfortable access to the area of interest and diagnostic and therapeutic control of the right and left brachiocephalic vessels (8). Several groups almost exclusively use a right femoral approach (9-12) and limit the use of other venous access sites, especially the internal jugular and basilic veins, only to special cases. Lanciego and Smayra (13, 14) propose the brachial stent, and Miller proposes the subclavian vein (15).

The use of a dual venous access, also proposed by several groups (16, 17), allowed us to achieve a technical success rate of 100% (47 stents in 34 patients) for 39 procedures without stent migration or local complications such as thrombosis or hematoma at the puncture sites.

Sedation and monitoring

In most published series (7-21), the procedure is performed under local anesthesia. Only Smayra (14) and Greillier (17) report the use of general anesthesia in specific cases, and sedation when required.

The use of a morphine derivative such as sufentanil compared to a combination of benzodiazepine and morphine derivative was preferred by our team since patients can be kept at a sufficient level of awareness to ensure cooperation, which we believe contributes to optimal results: bony landmarks are useful during stent deployment but only if they were initially acquired at a same phase of the respiratory cycle, usually deep inspiration.

Type of endoprosthesis

As a rule of thumb, the stent should be a little longer than the lesion: it is generally recommended to select a stent that is longer than the lesion by about 1 cm proximally and distally. Stent diameter must take into account changes in SVC diameter during respiration.

No significant difference is reported in the literature with regards to rates of technical and clinical success for the 3 most frequently used stents: Gianturco Z-Stent (5, 22-27), Palmaz stent (Johnson & Johnson, Warren, USA) (28-30) and Wallstent (10, 11, 13, 14, 19). Only historical series published on the Gianturco Z-
stent describe a higher rate of complications, including stent migration and incorrect positioning. Self-expanding stents are currently selected by most interventional radiologists because of their ease to cross lesions, their flexibility, and the range of available diameter and length. The stainless steel self-expanding Wallstent is the most frequently used stent (10, 11, 13, 14, 19). Nitinol stents are advantageous because they do not shorten, but no published data is available, to our knowledge, for this indication (31).

Mesh size also is the subject of discussions, without consensus at this time to our knowledge: larger mesh size usually leads to lesser hyperplasia in arteries, provide optimal collateral patency, but are more prone to intrastent tumor growth. Placement of a single stent across the right brachiocephalic vein and SVC may be challenging, especially with the more rigid Gianturco Z-stent and Palmaz stent. The flexibility of the Wallstent along with the wide range of available lengths and diameters allows coverage of the right brachiocephalic and SVC in a single procedure.

The role of covered stents is uncertain at this time, but they may be valuable to prevent intrastent tumor growth (31, 32).

Preservation of SVC bifurcation

When both brachiocephalic veins are involved, should both sides be treated or is unilateral stenting adequate? For Marcy, et al. (8), double stenting should be performed if catheter placement using the kissing balloon technique is easy. Both published studies on bilateral versus unilateral stenting (13, 34) show a recurrence rate 3 to 4 times higher for the bilateral stenting group. Dinkel, et al. (34) reported similar results for both groups with 100% rate of technical success and 91% and 90% rates for clinical success in the unilateral and bilateral stenting groups respectively. The rate of recurrence was significantly higher for patients with bilateral stenting: 28% compared to 9%. Lanciego, et al. (13) reported similar results: bilateral stenting is associated with a higher rate of recurrence (27% versus 7%), and restoration of patency of the SVC and unilateral brachiocephalic vein usually is sufficient for resolution of clinical SVCS. We prefer performing unilateral stenting of the right brachiocephalic vein and SVC. Venous return from the left brachiocephalic vein through the mesh of the stent is possible. In 2007, the French Society of Cardiovascular Imaging (33) recommended that obstructive lesions of the SVC confluence should be treated with unilateral stenting, due to the presence of cervicothoracic venous collaterals between both systems. The side the least involved by the tumor is stented. Based on these same guidelines (33), bilateral stenting should be limited to patients with extensive bilateral compression and/or tumor involvement, reducing the efficacy of venous collaterals, and the position of the bilateral brachiocephalic stents in the SVC should be symmetrical to avoid compression of one stent by the other.

Thrombus and malignant stenosis

Most authors administer an intravenous bolus of heparin, between 3000 and 5000 UI. In situ thrombolysis has been proposed when clot is present in association with malignant SVC stenosis. Mechanical thrombus aspiration may also be performed as an alternative or complement to thrombolysis. There is no consensus in the literature with regards to thrombolysis. Similar to Boardman, et al. (35), we believe that thrombolysis may be dangerous in patients with metastases, especially CNS metastases.

Anticoagulants and platelet aggregation inhibitors

There is no consensus in the literature with regards to a compromise balancing risk of recurrent thrombosis and prevention of hemorrhagic complications. During the procedure, anticoagulation with heparin is routinely used. After the procedure, management ranges from absence of treatment (12), to the combined use of anticoagulants and platelet aggregation inhibitors (10, 11, 19), for variable periods of time. After placement, stent narrowing may occur due to fibroplastic proliferation. This intimal hyperplasia could be reduced by the use of platelet aggregation inhibitors (31, 36). Acetylsalicylic acid appears to be a drug of choice because of its anti-inflammatory, analgesic, and anti-platelet properties and low cost. As such we believe that it is reasonable to propose at least the use of a platelet aggregation inhibitor. For Uebe- roi (CIRSE Guidelines 2006) (32) anticoagulation remains “controversial”. In recent guidelines on SVC angioplasty, the French Society of Cardiovascular Imaging (33) proposed the use of “preventive anticoagulation with low molecular weight heparin after stenting, for a duration to be based on response to the treatment according to the recommendations of the French Society of Cardiovascular Imaging, angioplasty must be performed using a low pressure balloon with diameter slightly inferior (~2 mm) to the stent diameter, without seeking immediate complete stent expansion, which will occur spontaneously over the next few hours or days, in order to avoid local hemorrhagic complications (venous wall dissection, rupture, tamponade).
anti-cancer treatment”. This treatment “may be discontinued after a few months in patients with complete or partial response, and must be continued in patients with failure of medical treatment and disease progression”.

The decision may be deferred to clinician oncologists, since long term use of low molecular weight heparin may cause heparin induced thrombocytopenia, further worsening the chemotherapy induced thrombocytopenia.

**Prevention and treatment of restenosis**

Recurrent SVCS after stenting is due to intrastent tumor growth and/or thrombosis. As such, several theoretical preventive measures may be available. In practice, it is mainly based on the prevention of thrombosis. Covered stents could be advantageous to prevent intrastent tumor growth, but they are more thrombogenic and occlude collateral vessels: to our knowledge, no report has been published on the use of such stents for this indication. Drug eluting stent may also play a role in the prevention of restenosis, especially stents coated with anti-mitotic drugs (Paclitaxel, Boston Scientific, Natix, USA). To our knowledge, the use of brachytherapy has not been reported for the prevention of SVC stent restenosis.

Late recurrence is generally due to intrastent tumor growth, across the stent mesh. Thrombosis may also be present, intrastent or nearby. Rarely, fibrosis may occur, especially after radiation therapy. Restenting is necessary and performed by all authors in case of intrastent tumor growth. Thrombolysis is limited to cases of thrombosis, sometimes associated with removal of a central venous catheter.

**Results**

Our results are consistent with reports from the literature (8-17, 19-21, 32) (table II): rate of technical success near 100% and rapid clinical improvement, usually within 24 hours. Reported complications include, in addition to hemorrhagic complications due to anticoagulants and complications due to stents (incorrect position, fracture, migration), acute pulmonary embolus and acute pulmonary edema, as well as tamponade. While acute pulmonary edema is a “classical” complication following SVC recanalization due to abrupt increase in venous return that may lead to heart failure, pericardial tamponade (35, 37-39) is seldom reported in the literature. The possibility of tamponade should be raised with distal SVC lesions near the right atrium especially when catheter placement across the lesion was technically difficult (cases of occlusion). When in doubt, pulmonary angiography and echocardiography may be immediately performed and confirm a diagnosis of tamponade by showing pericardial effusion and collapse of the right cardiac chambers, allowing prompt treatment.

In retrospect, we believe that our case of tamponade was due to dissection of the distal SVC wall by the hydrophilic wire during recanalization, with penetration in the extravascular space and pericardial recess with eventual passage of blood into the pericardial space after SVC recanalization.

Recurrent SVCS is most frequently amenable to repeat endovascular treatment. In our series, the primary and secondary rates of patency were 81% and 100% respectively. The detection of in situ hemorrhagic complications requires dedicated attention. SVC rupture during angioplasty or dissection of the SVC or right atrium, especially with attempted recanalization of an occluded SVC, may cause hemopericardium that must be readily diagnosed and promptly treated. Pulmonary angiography may be performed to exclude acute pulmonary embolus. Echocardiography should be performed immediately in the angio suite to confirm the presence of hemopericardium and provide imaging guidance during pericardiocentesis.

**Indications**

Management of SVCS may be medical, aimed at reducing venous pressure: semi-
Endovascular treatment of SVC syndrome from neoplastic origin: a review of 34 cases

Table II
Results for SVC stenting for malignant SVCS. Comparison between our results and those from the meta-analysis of Uberoi (40 series) (32).

<table>
<thead>
<tr>
<th>Technical success</th>
<th>Clinical success</th>
<th>Recurrence Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meta-analysis Uberoi 2006 (mean %)</td>
<td>99 (95-100)</td>
<td>94 (80-95)</td>
</tr>
<tr>
<td>Our series (%)</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

sitting position, steroids, diuretics, anticoagulants, with limited clinical results (8, 18). Radiation therapy, considered as the standard treatment for a number of years, especially for radiosensitive tumors such as NSCLC and lymphoma, has a 2-3 weeks delayed response time (40-42). Clinical worsening of symptoms may occur during the first few days after treatment due to edema; the recurrence rate is between 20-50% (42). In addition, decompressive radiation therapy may preclude the future use of curative radiotherapy. Chemotherapy with tumor lysis may lead to symptomatic improvement in patients with SCLC, but requires hydration with the use of platinum salts. Surgical management of SVCS is mainly considered after failure of all other treatment options or with benign SVCS (43). Endovascular management is palliative: longterm patency is not the main goal. Results compare favorably to those of chemotherapy and radiation therapy; a meta-analysis from Rowell, et al. (4) published in 2002 even concluded that SVC stenting was more effective and showed faster clinical improvement. Recommendations from the French Society of Cardiovascular Imaging (33) for 2007, based on most recent international publications, indicate that SVC stenting: “should be a first line treatment for patients with severe and poorly tolerated SVCS, and a second line treatment after failure of alternate therapies (chemotherapy, radiotherapy, steroids), or a complement to the latter”. Endovascular treatment is advantageous for patients with poorly tolerated SVCS because it can rapidly be implemented and provides nearly immediate symptomatic improvement (within 24 hours). Stenting is the treatment of choice after failure of chemotherapy and/or radiotherapy. After rapid restoration of SVC patency following stenting, chemotherapy with platinum salts and required hyperhydration may be resumed. The use of primary stenting prior to chemotherapy (anaplastic tumor) may also be considered.

Conclusion

The incidence of SVCS in patients with bronchogenic carcinoma is 4%, all causes included (2). For these patients, treatment is frequently palliative, and the management of symptomatic SVCS may be based on medical therapy, radiotherapy, chemotherapy or endovascular therapy. Advantages of endovascular treatment include a low rate of complication, prompt regression of symptoms following stenting compared to chemotherapy and/or radiotherapy, and a lower rate of recurrence. Our series shows consistent results in a single center using a standardized protocol. Our results are consistent with reports from the literature with rates of clinical and technical success of 100%, a recurrence rate of 19%, and primary and secondary patency rates of 81% and 100%. A limitation to our study is its retrospective nature. Several technical considerations remain subject to discussion, especially with regards to anticoagulation: it appears that platelet aggregation inhibitors should at least be used. The availability of new technologies and techniques for endovascular treatment could further improve the durability of results.

References


