

A Vascular Access Report for the Year 2009

“Access planning, execution and maintenance!!”

Michigan Vascular Access, PC
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Introduction and general information on Michigan Vascular Access, PC
activity for the year 2009

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Dear Doctor or dialysis professional:

At Michigan Vascular Access PC, we have been honored by your referral of one of more patients for help with their hemodialysis access needs. This letter contains a report of our activities for the year 2009.

Numbers and statistics

Patients

In 2009, 300 patients new to our practice were seen: 37 pre-dialysis patients (12%), 130 new-to-dialysis patients needing first-time access (43%), 64 patients with previous access needing new access (21%), and 69 patients with problematic accesses performed elsewhere needing intervention (23%). In addition, over 410 established patients were seen with problems of their existing access. Over one thousand open operative and endovascular procedures were done in 2009.

Ultrasound mapping

Two ultrasound machines are available in the Michigan Vascular Access office - every patient has an ultrasound examination as part of the initial evaluation, and at most post-operative visits thereafter. Over five hundred "official" (billable) ultrasounds and countless "unofficial" (non-billable but still valuable) exams were done in 2009. Dr. Webb has been doing office ultrasound on all access patients since 2000. Your patient may have come to us with results of ultrasound "mapping" done elsewhere - these results were gratefully reviewed and included in our assessment.

Patients with fistula options

Of the 37 predialysis patients, 33 (91.6%) were found to have fistula options, 3 (8.3%) were offered a graft, and one was advised to not have access placement.

Of the 130 naive (new-to-dialysis) patients currently dialyzing via catheter, 78 (64.5%) were found to have fistula options, 43 (35.5%) were offered a graft, and 9 were either advised to not have access placement or were pending additional studies.

Of the 64 patients currently dialyzing via catheter with a history of previous accesses, 25 patients had one previous access, 24 had two previous accesses, 9 had three previous, 4 had four previous, one patient had five previous and one six. Twenty-nine (47.5%) were found to have fistula options, 29 (47.5%) were offered a graft, and 3 were either advised to not have access placement or were pending additional studies.

Established patients and new patients with problem access were offered a wide variety of solutions, including new accesses (fistulas and grafts), revisions, thrombectomies of old access and venoplasty.

Overall, 283 new accesses were placed, with 192 fistulas and 91 grafts, for an overall fistula rate of 68%. The lower percentage of fistulas in the larger population (as opposed

to the predialysis patients) reflects the referral and repeat nature of the practice, since a significant number of patients are seen after multiple failed dialysis accesses elsewhere.

Venography prior to or concurrent with access placement

Venography before access creation is indicated in cases where there is an ipsilateral pacemaker, a long-standing (greater than six months) catheter, in extremities with a history of DVT or arm swelling, and in an extremity with a previously failed access. In some cases, a bilateral venogram may be ordered prior to the surgery to define access options, but this takes time, and frequently central venous anatomy is not well demonstrated by injection through small IVs in peripheral veins.

More frequently, we recommend a venogram to be included at the time of surgery, with the added benefit that, once in the vein, a catheter can be run up to the central veins for contrast injection and a clearer definition of the anatomy. Any lesion noted can be treated with venoplasty or stenting prior to placement of the access. In 2009, eighty patients were recommended to have an intraoperative venogram at the time of access placement. Six were found to have occluded central veins and the access placement was abandoned to avoid unacceptable complications. Seventy-four of the eighty went on to have an access placed, nineteen after venoplasty and four after stent placement.

One patient had fistula creation despite central venous occlusion as a calculated risk necessary due to the lack of other options – the risk was worthwhile, and the access became usable.

Maturation of fistulas

Maturation of fistulas once created is an important function in our practice. Once created, the fistula is examined with ultrasound at two weeks and generally at three-week intervals thereafter until ready for cannulation or until a corrective procedure is indicated. Corrective procedures include branch ligation (over sixty cases), superficialization (over twenty cases in 2009) or venoplasty (an unknown number of the over 400 venoplasties done in 2009).

Once fistulas are judged adequate for release, in many cases an ultrasound-assisted digital photo diagram is created to guide cannulation by the dialysis unit (example attached). This “user’s guide” reduces problems with early cannulation that compromise fistula integrity and demoralize the patient.

Maintenance and repair of dialysis access

Maintenance and repair of existing access is also an important focus of the practice. Problems are detected by physical examination or performance parameters (see the “warning signs”), and diagnoses may be made by physical examination, with the aide of ultrasound, or by fistulography. Correction of the abnormality is normally indicated to improve performance of the access (clearance), to reduce or eliminate complications (aneurysmal formation, bleeding, rupture, venous hypertension, digital ischemia), and to preclude loss (thrombosis). Treatment may include fistulography and venoplasty with or without stenting, and revisions in dysfunctional accesses to address problems of access

performance and to preclude loss of access. These procedures are indicated when clinical abnormalities are noted (the “warning signs”, attached) or when monitoring modalities (venous pressure monitoring, flow measurements, declining clearances) indicate a need to investigate and intervene. Flow measurements may be used to guide and validate interventions, and to provide baseline flow values.

At least four hundred and fifty maintenance procedures were performed in 2009.

Forty-four operative revisions of problem accesses were done in 2009, with superficializations, re-transpositions, graft interpositions, and arterial reanastomoses. The useful life of existing accesses is being prolonged. Inaccessible fistulas are made usable.

Aneurysms

Treatment of aneurysms in fistulas has been increasing as larger numbers of fistulas age and become dangerously dilated or ruptured (pseudoaneurysms). Thirteen AV access aneurysms or pseudoaneurysms were resected and repaired with graft segments, six of the thirteen after rupturing. An additional 24 aneurysmal fistulas were surgically reduced in size and in some cases banded with PTFE to prevent them from regrowing. Risk of rupture with torrential bleeding is reduced, and the access utility is maintained.

Treatment of clotted access

Restoration of access after clotting is also an important service of Michigan Vascular Access. Thrombectomies, mostly percutaneous (ninety-two – 86% of the total), or combined with open operative techniques (15 - mostly clotted fistulas with aneurysmal areas filled with laminated clot) also rescue lost accesses and extend their useful life. I take pride in the successful rescue of fistulas clotted for as long as two months in several cases, often judged “impossible” in other centers.

Open operative and endovascular procedures

The combination of open and endovascular procedures is an “added value” and an important advantage in dialysis access practice. Beyond the 80 patients with intra-operative venography mentioned above, 110 additional patients had combined procedures in 2009. Twenty-two of 85 catheter removals had concurrent venoplasties. Seventy-three revisions of various kinds had an endovascular element. The ability to provide both modalities in the same setting reduces time, minimizes failures occurring “for want of a nail” and increases the chances of successfully solving the patient’s problem.

Discussion

Michigan Vascular Access PC is a professional surgical practice dedicated to providing and maintaining effective vascular access for hemodialysis patients: from initial long-range planning and provision of the optimal first access in new dialysis patients, to maintenance and rescue of dysfunctional or failed accesses. Open surgical and endovascular techniques are employed by a board-certified surgeon in a C-arm

fluoroscope-equipped operating room, always with anesthesia support, and always in a JCAHO-accredited hospital.

Michigan Vascular Access PC uses the Dialysis Outcomes Quality Initiative (DOQI) guidelines to help us provide defensible and up-to-date dialysis access care. The DOQI guidelines have been boiled down to three main points: (1) provision of fistulas in all eligible patients, (2) avoiding or limiting catheter usage to avoid damage to the major veins, and (3) monitoring of access performance with pre-emptive intervention to avoid access loss. These three provisions drive much of our decision-making processes.

Michigan Vascular Access PC uses a “case management” approach to the care of the dialysis patient. We follow patients over time as much as possible, whoever may be delivering episodic care, in order to provide the most logical long-term management. This demands more staff time, and is more expensive to provide, but leads to long term benefits to the patient.

Michigan Vascular Access PC sees patients from over seventy-five dialysis units all over Southeast Michigan and extending from Battle Creek and Kalamazoo to Monroe, to Flint and Lapeer, Fowlerville and Fenton, Muskegon and beyond. Michigan Vascular Access is a true regional surgical practice.

Meetings

Dr. Webb stays at the cutting edge of dialysis access provision by participating in national meetings (VASA, CIDA, ASDIN, Veith), by continuous review of the literature, and by monitoring and analyzing his own results. He has participated as a faculty member in the last two Controversies in Dialysis Access (CIDA) Meetings, in Washington, DC, October 2008, and in San Francisco, October 2009.

In Washington DC, Dr. Webb presented his series of 116 elderly patients (over 80 years of age) and 223 obese patients (BMI greater than 35 and up to a “superobese” 52), demonstrating that maturation-to-usability of carefully planned fistulas reached 80% in both populations, that achieving a 60% usable fistula rate in these difficult populations was possible, and that achieving both these goals depended on a liberal use of advanced fistulas (transpositions and superficializations). Dr. Webb has performed nearly 500 such advanced fistulas.

In San Francisco, Dr. Webb gave a cautionary presentation on complications of axillary stenting, showing cases with unexpected complications of axillary stents kinking the outflow veins. Having placed over 1000 vascular access stents in the last nine years and nearly 7000 access procedures overall, Dr. Webb is one of the first to say that the placement of stents requires more experience and judgment than may be appreciated. Stents can treat many problems, can cause problems, are not a cure-all, and once placed are very difficult to remove. **WE DISAGREE WITH A RECENT INDUSTRY PROPOSAL FOR PRIMARY STENTING OF VENOUS OUTFLOW STENOSES!!!** This proposal will certainly lead to the placement of more outflow stents, more industry profits, many unnecessary stents and more long-term problems. Stents are like a pistol in

the pocket – they are fun to use, get immediate results, but cause long term effects that may be unpredictable.

Central venous stenosis

Our recent collaboration with Gore, Inc, yielded important information about the effective treatment of central venous stenosis. PTFE-covered stents were compared with simple venoplasty and bare-wire stents. The cumulative patency results for PTFE-covered stents included a clearly superior > 90% one-year cumulative patency, demonstrating that PTFE-covered stents represent an important method for treatment of central venous stenosis. Even so, stent placement in central veins is guided by an algorithm emphasizing long-term follow-up and analysis of results. Currently we are following over 100 patients with central stenosis.

Transposed basilic fistulas

Results on maturation and release of 266 transposed basilic fistulas were discussed at an industry meeting in Singer Island in February 2009. At that meeting, three different types of transposed basilic fistulas (BVTs) were compared to AV grafts: BVTs performed in one stage using the toughened basilic vein above a previous forearm access were released for use in five weeks on the average; BVTs performed in one-stage with a naïve but sizable basilic vein were released after seven weeks; and BVTs performed in two stages with a preliminary fistula and delayed transposition were released in 120 days (three months). AV grafts were released in three weeks on the average.

We are currently looking at our success rate with these operations, and the time to maturation of advanced fistulas with the aim of making better clinical judgments about who should have a graft and who should have a fistula when prolonged time on the catheter means more central damage.

We are also seeing a number of dysfunctional transpositions performed elsewhere. Although I have performed my share of ugly fistulas in the past, after 350 transpositions most of the kinks have been ironed out. Success rates exceed 90%. Superficializations and transpositions should be done preferentially by surgeons who do an adequate number, so that patients don't pay the price of too many learning curves.

The Artegraft

In the last year, you may have received letters saying that your patient was recommended to have an "Artegraft" and wondered about it. The Artegraft, a bovine carotid artery graft cured and sterilized with no remaining antigenicity, is the first FDA approved vascular graft, and has been found to have many desirable properties similar to human blood vessels. Consequently, for over six months we used the Artegraft biological graft almost exclusively, placing approximately 100, hoping for results more like a fistula than a graft. Unfortunately, the biological graft did not give results impressive enough to justify the increased cost, and we are now using it in selected situations only. *The Artegraft will not replace the AV fistula.*

Inpatient versus outpatient surgery

We are frequently asked to see patients for evaluation and placement of dialysis access during their initial hospitalization. I believe that this is rarely appropriate: (1) patients and their families are frequently overwhelmed by the unexpected situation and all the new information – a week or two of orientation and an educational office visit can make a big difference; (2) a patient in the acute phase of a serious illness is rarely the best patient for an elective outpatient surgery – two weeks of dialysis and medical optimization can make a big difference; (3) a thorough office ultrasound of a stable patient tends to be better than the bedside exam of an ill patient – I have told patients in the hospital that they had “no fistula options” based on their bedside ultrasound and then found excellent veins for a fistula weeks later in the office; and (4) devoting two hours to driving across town to “meet” a patient is not a good use of my time when patients are clamoring to make appointments in my office – every hospital consult takes the time of four office consultations.

I understand the desire to “get something in” the patient as soon as possible, but offer further points: (1) you will be able to find someone to put that access in, but it’s more important to do something right than to do something right now; (2) the patient who gets a fistula but dies before discharge or withdraws from treatment is not a save; and (3) the non-compliant patient with an IJ permacath, and the non-compliant patient with an IJ permacath and an immature fistula are the same person - still likely to do poorly long-term due to their non-compliance.

Quality

I decry the overemphasis on dialysis access business that I see in the national meetings and on the local scene. Several companies are ready to build you an access center, and even provide some limited training (and an expensive loose leaf manual). The best interests of the patients risk being overshadowed. In my mind, the best way to approach possible changes in the way services are being delivered is to ask “How can we improve the quality of dialysis access services?” Good quality service becomes good business. On the other hand, exploiting a business advantage does not necessarily improve quality – usually it does the opposite.

At Michigan Vascular Access we focus on a specific limited area of expertise and provide services that we believe are second to none in the region. If we become convinced that another provider does a better job at a specific task, we refer the patient (examples: thigh grafts, catheter placement, advanced arterial work, some central venous work from the femoral approach, etc). There is more than enough work to go around, and the best interest of the patient rules.

In the last ten years of full-time vascular access work I have performed nearly 7000 vascular access procedures: 1400 fistulas, over 500 grafts, 500 revisions, and over 3000 endovascular procedures. Every week brings new challenges and new lessons – I am still learning. This work cannot be mastered in 25 cases, or 250, or 2500. It is much more complicated than I ever dreamed when I accepted the assignment at Henry Ford Hospital from Dr. Frank Lewis in 2000.

In a time when fistula maturation rates of only 50-60 percent within 6 months are being widely quoted in national meetings and publications we should be asking some questions: (1) Is a 50-60% success rate acceptable? (2) Is a 6 month maturation period acceptable when consequent central venous stenosis is such a serious problem? (3) Is it a sign of serious problems when a patient has three or four failed access operations before being referred to a more experienced access surgeon? (4) Are we doing the best we can?

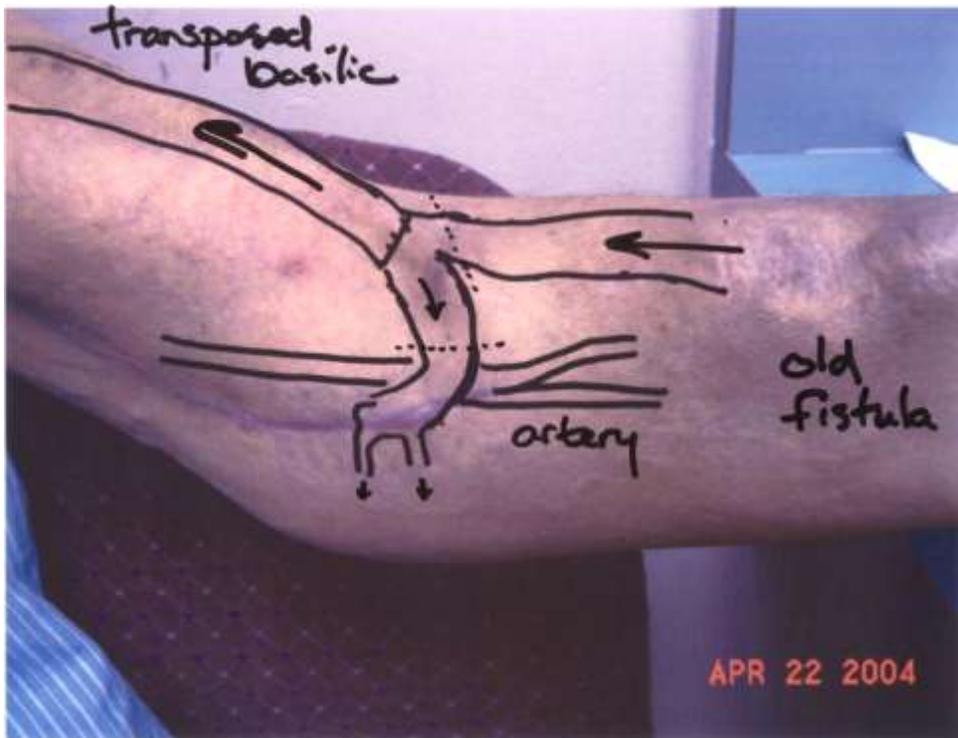
Hopefully, a real discussion can begin in our community about providing quality care. In the meantime I have some partial answers or opinions: (1) We are NOT doing the best we can - a 50-60 percent fistula maturation rate is a national scandal and cannot be tolerated – we MUST do better; (2) Central venous stenosis robs our patients of their options and six months on a catheter is too long – we must get the catheters out as soon as possible; (3) A surgeon doing access surgery ought to be able to tell a patient “These are your options – you have a 80-90% chance of having a useful access within three months”, or that surgeon should not be asked to provide dialysis access services; (4) Business opportunities and turf issues should not be allowed to get in the way of quality service.

I look forward to 2010. There are questions to answer, progress to make, and patients to serve. Every year we make many friends. Every year we lose a few friends. We lose and we mourn, but not for long, as the living demand that we keep working. Karma.... As always, our office staff (Lucretia, Lynne, Luba, Shauna and Tina) stand ready to smooth your patient’s way toward effective vascular access, and to lessen the access burden on members of the dialysis community. We are ready to try to solve problems.

Thank you for the trust you have placed in us.

Sincerely,

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Digital photo diagram to guide the unit



Skin defect over fistula – don't pick the scab!!



Superficialized brachiocephalic fistula



Aneurysmal fistula



Transposed basilic fistula



Flair stent kinking outflow vein as arm is brought to side