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Research Articles

Case Report

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Early period results for repair of complex thoracic aortic diseases with E-vita open stent graft

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Abstract

Aim: Nowadays, usage of hybrid techniques in complex aortic diseases, especially in the high risk patient group for conventional surgery, enables us to cope with the challenges posed in major surgery and reduce complications. In this study, we evaluate our early results in patients who underwent Frozen Elephant Trunk procedure using e-Vita Open stent grafts for complex aortic disease.

Methodology: A total of 61 patients (mean age 56 ±11.5, 50 patients (81.9%) were male) who underwent E-vita Open Plus repair between January 2013 and October 201, with the diagnosis of either acute / chronic type I aortic dissection, acute / chronic type III aortic dissection, or thoracic aortic aneurysm were analyzed retrospectively. 21 patients (34.4%) had acute / chronic type I aortic dissection, 22 (36.0%) had acute / chronic type III aortic dissection, 11 (18.0%) had thoracic aortic aneurysm and 7 (11.4%) had residual type I aortic dissection.

Results: Arterial cannulation sites were right subclavian artery in 57 patients (93.4%), brachiocephalic artery in 2 patients (3.2%) and ascending aorta in 2 patients (3.2%). The mean times for antegrade cerebral perfusion and cardiopulmonary bypass were 80 minutes (range 52-167) and 178 minutes (range 105-350) respectively. First 30-day mortality rate was 7 (11.4%). In terms of neurological deficit, 2 patients (3.2%) had paraplegia, 3 (4.9%) had major stroke/coma and one (1.6%) had right hemiplegia. Patients with paraplegia and hemiplegia recovered completely and were free of any neurological deficits during discharge.

Conclusion: Frozen elephant trunk procedure is a good alternative method which makes the techniques of surgical repair more feasible in the treatment of complex aortic diseases and enables us to use the combination of surgery and endovascular techniques to reduce complications.

Key words: Aortic dissection, complex repair, frozen elephant trunk, early results

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Introduction

Classic surgery procedure in complex thoracic aortic diseases has high rate ratio of mortality and morbidity as well as its difficulty.[1] For this reason, it was applied to hybrid methods in order to eliminate the risks of classic surgery and render it more feasible. The evolution process began with conventional Elephant Trunk Procedure and two-stage treatment protocols were formed by combining endovascular stent grafts. Nowadays this becomes one-stage applicable form by means of stent grafts implanted by anterograde route. Frozen elephant trunk technique, of which we have used open surgery with concomitant endovascular treatment is a hybrid treatment procedure that has acceptable and lower rate of mortality and morbidity when compared to classic surgery.[2]

In our clinic, the first implementation of FET procedure was begun with a patient diagnosed with thoracic aortic aneurysm in 2012. We began to use it widely in complex aortic diseases after gaining experience by expanding the field of application with Type I and Type III aortic dissections. In our study, we present the early period results of FET procedure performed on complex aortic diseases between the years of 2013 and 2015.

Materials and Methods

Patient profile

61 patients who underwent to Frozen elephant trunk stent graft implementation and thoracic aortic surgery between January 2013 and October 2015 were included in this study. Data were collected prospectively and examined retrospectively. Their average age was 56.0±11,5 (between 25 to 81) and 50 patients were men (81.9%). The demographic properties of patients are shown in Table 1. The diagnoses of cases at the time of admission to hospital were pointed out in Table 2.

Definitions

Early mortality definition corresponds to the first 30-day mortality. Emergency surgery includes the patients who were operated within the first 24 hours of the beginning of symptoms and admission to the hospital. Preoperative and postoperative contrast enhanced thoracoabdominal computed tomography was used for the diagnosis of aortic pathology, preoperative planning and follow-op of the patients. During the physical examination patients who had findings that might point out a possible neurological complication, were consulted and followed up by a neurologist. Patients who had a previous pulmonary disease diagnosis or pulmonary function tests with FEV1 <30% and FEV1/FVC <50% were accepted to have COPD. Serum creatinine

Table 1. The characteristics of the patients

	n (%)	Range
Age	56.09±11.5	25-81
Sex (Male)	50 (81.6%)	
CAD	9 (14.7%)	
BMI	25.8±2.7	
DM	7 (11.4%)	
COPD	17 (27,8%)	
Serum creatinine > 1.7mg/dL	3(4,9%)	
HT	55 (90,1%)	
CVE	3 (4,9%)	
EF<%35	5 (8,1%)	
Marfan Syndrome	4 (6,5%)	
ARSA	2 (3,2%)	
Emergency	23 (37,7%)	
Previous Operations	10 (16,3%)	
Valve	1 (3.8%)	
Dissection or aneurysm	7 (11.4%)	
TEVAR	2 (3.2%)	
Vascular	1 (1.6%)	
Aortic diameters (mean ± SD, mm)		
Ascending aorta	47.8±10.9	30-82
Aortic arch	41.5±8.2	30-80
Descending aorta	51.3±13.1	31-83

CAD: *Coronary artery disease,* ***DM:*** *Diabetes mellitus,* ***COPD:*** *Chronic obstructive pulmonary disease,* ***HT:*** *Hypertension,* ***CVE:*** *Cerebrovascular event,* ***EF:*** *Ejection fraction,* ***ARSA:*** *Aberrant right subclavian artery,* ***TEVAR:*** *Thoracic Endovascular Aneurysm Repair,* ***SD:*** *Standart deviation*

levels of 1.7 mg/dL or more were accepted as renal failure. Patients who had a history of coronary artery disease or were newly diagnosed during the preoperative diagnostic evaluation, were included in coronary artery disease group. Cerebrovascular events that occurred more than 72 hours ago correspond to cerebrovascular disease definition.

Operation technique

In our study, E-vita Open Plus prosthesis were used in all cases. Central catheter, arterial monitorization in left arm, cerebral pulse oximetry were routinely used in all patients. The drainage catheter of cerebrospinal fluid were implemented in cases with acute type I aortic dissection. Arcus repair was done at medium hypothermia with unilateral selective antegrade cerebral perfusion (flow rate 10-15 kg/min). In case of detecting a significant decrease at cerebral pulse oximetry we switched to bilateral selective antegrade cerebral perfusion by insertion of an additional arterial cannula in left carotid artery. Median sternotomy was implemented in all patients. To initiate cardiopulmonary bypass left subclavian artery, brachiocephalic artery or ascending aorta was used for arterial cannulation, whereas right atrial or bicaval cannulation was used for venous drainage. Venting cannula was placed in right superior pulmonary vein. Myocardial protection was provided by blood cardioplegia. Proximal aorta repair was performed on cooling phases. When nasopharyngeal temperature was at 26 oC, it was switched to selective antegrade cerebral perfusion by removing aortic clamp. E-vita Open Plus prosthesis were fixed to the aortic wall with U sutures at Zone 2 and Zone 3 levels. FET prosthesis was verified to be in true lumen by transesophageal echocardiography guidance in patients with dissection. Afterwards, Dacron graft which was previously anastomosed to proximal aorta and E-vita Open Plus prosthesis were anastomosed to each other.

Table 2. Admission diagnosis of aortic pathologies

	n (%)
Acute Type I Aortic Dissection	17(27.8%)
Chronic Type I Aortic Dissection	4(6.5%)
Acute Type III Aortic Dissection	3(4.9%)
Acute Type III Aortic Dissection + Ascending Aorta aneurysm	4(6.5%)
Chronic Type II Aortic Dissection	6(9.8%)
Chronic Type III Aortic Dissection + Ascending Aorta aneursym	9(14.7%)
Descending aorta aneurysm	2(3.2%)
Diameter of thoracic Aorta > 55mm	7(11.4%)
Ruptured Thoracic Aorta	2(3.2%)
Residual Type I Aortic Dissection	7(11.4%)

Graft Size Choice

In patients with aneurysm suitable stent graft size was arranged by oversizing (10-20%) the landing zone for descending aorta. Stent graft size in patients with dissection was determined by measuring actual lumen diameter and native descending aorta diameter at the level of left subclavian and it was not oversized. Seventh thoracic vertebra was determined as border level where distal edge of FET stent graft ended. However, this changed depending on height of patient and proximal anastomosis level.

Statistical Analysis

The statistical analysis were performed with the SPSS 22.0 statistical software. Data were analyzed by using descriptive statistical methods such as mean, standard deviation and frequency.

Intra Operative Results

Most commonly used surgical technique with FET procedure was the separated graft in the ascending aorta and the islet-shaped replacement of aortic arch in 34 patients (55.7%). Right subclavian artery was primarily chosen for arterial cannulation (n:57, 93.4%). Operation information and distribution of operation types were stated in Table 3.

Postoperative Results

On the first 30 days, 7 patients were lost in total of (11.4%). 2 of these patients (3.2%) had type I aortic dissection and 1 (1.6%) had ruptured aneurysm. These 3 patients (6.5%) were cases among ones applied to emergency department. It was found that the causes

of their death were aortic (n:3), multiple organ failure (n:3), neurologic (n:1).

In postoperative ICU follow-ups, patients who had suspicious findings during physical examinations were evaluated by neurologist. It was determined that 3 patients (4.9%) had permanent neurologic deficit (stroke and coma) and 4 patients had (6.5%) spinal cord ischemia (paraplegia and paraparesis) and 1 patient (1.6%) had hemiplegia. Neurologic deficit was not detected in physical examinations of 2 patients with paraplegia and a patient with hemiplegia during discharging from hospital. Most of the patients with stroke were observed in patients with type I aortic dissection (n:2, 66.7%) and spinal cord injury was observed to occur more frequently in patients with type III aortic dissection (n:2, 50%). The other postoperative complications were shown in Table 4.

Table 3. Distribution of operative parameters

	n (%)
AASGI + Aortic arch (island) + FET	34(%55,7)
AASGI + Debranching (Y graft) + FET	12(%19,6)
FET + Debranching	6(%9,8)
FET	7(%11,5)
FET + Antegrad Visceral Debranching	2(%3,3)
Additional interventions	
Benthall de Bono	6(%9,8)
Aortic suspension	2(%3,3)
CABG	1(%1,6)
Mitral valve	5(%8,2)
Endovascular	1(%1,6)
Cannulation	
Axillary	57(%93,4)
Brachiocephalic	2(%3,3)
Ascending aorta	2(%3,3)
Transesophageal temperature (oC) mean (±SD)	24.85±3.67
Operational values (min) mean(±SD)	
Total perfusion time (minutes)	178.57±49.71
ASCP (minutes)	80.08±25.29
Visceral ischemia (minutes)	72.49±23.67

FET: *Frozen Elephant Trunk,* ***AASGI:*** *Ascending aorta separated graft interposition,* ***CABG:*** *Coronary Artery Bypass Grafting* ***ASCP:*** *Antegrade Selective Cerebral Perfusion*

Discussion

The description of new intervention models has been needed with the requirement of gross surgery in order to access descending aorta in treatment of complex aortic diseases.

After Borst and coworkers[3] described the conventional elephant trunk technique; the combination of thoracic endovascular aortic repair technique (TEVAR) with this conventional technique inspired the two-stage treatment of complex aortic diseases.[4-6] Afterwards, Kato and coworkers[7] took first steps of one-stage treat-

Table 4. Distribution of post operative properties

	n (%)
30 day mortality	7(%11,5)
Stroke	3(%4,9)
Paraplegia	2(%3,3)
Paraparesis	2(%3,3)
Hemiplegia	1(%1,6)
Pulmonary Complications	5(%8,2)
Renal Failure (Permanent/Temporary)	7/2(%11,5/3,3)
Wound complications	5(%8,2)
Re-exploration: Tamponade	6(%9,8)
Re-exploration: Bleeding	5(%8,2)
Re-exploration: Sternal dehiscence	2(%3,3)
ICU duration days (mean±SD)	4.93±5.66
Discharge day (mean±SD)	14.11±14.96

ICU: *Intensive Care Unit*

ment by doing replacement of stent graft through anterograde route and pioneered the improvement on antegrade implantation of stent grafts with increasing experience and development of technology until today.[8-13]

In our study, mortality was observed as 9.6% for first 30 days and this was found to conform to the literature. Mortality varied between 3.8% and 17.2% in conducted studies using FET technique without grouping complex aortic diseases.[8,10,14,15,16] When the complex thoracic aortic diseases were arranged into groups, especially in type I aortic dissection, Pochettino and coworkers[9] stated the conditions requiring emergency cardiac surgery as an independent risk factor for mortality and it was reported that mortality percentage was 13.9 for first 30 days. Likewise, as known, acute type I aortic dissection with mortality percentage varying between 7.8 and 18.2 in the literature was observed to be a predictive factor on mortality independently of operation.[17,18] In our study, for acute type I aortic dissections, mortality was 11.7% for first 30 days.

In aortic arch surgery, the most important factor affecting mortality and life quality of patients is undoubtedly the development of neurologic complications. The prevalence of permanent neurologic deficit was higher in acute type I aortic dissections required immediate treatment since arcus components was affected easily by dynamics and mechanic changes caused by dissection flap.[19] Similarly, in our study, the stroke development was found to be related with the acute type I aortic dissection.

Development of ischemic spinal cord injury is the most feared complication in cases with descending aorta pathologies requiring surgical intervention. Utilization of cerebrospinal fluid drainage, adjusting the distal landing zone above the level of T7, keeping the anterograde perfusion time short, paying attention to the continuity of left subclavian artery are the precautions that can be taken for spinal cord protection. However, in spite of the protection methods of spinal cord, percentages of paraplegia as 21.7 and 24[14,20] stated in the literature are demoralizing, the presence of successful series stated as 8% and 9%[13,21] is encouraging.

In our study, spinal cord injury was 5.7 % and patients with type III aortic dissection were majority and this was in accordance with the literature.[20] In cases with type I aortic dissection which required urgent surgical repair of proximal aorta, it is stated that the possibility of a re-intervention to the distal aorta will be markedly high within 10 years, with a ratio of 25-30%.[22]

With our gaining experience from patients with these residual type I aortic dissections in our clinic, we have implemented a single stage arcus aorta replacement and FET technique in acute type I aortic dissection patients who are young in age or have Marfan syndrome or have descending aorta diameter of 40mm or more in order to prevent the late period of complications related to a secondary rupture or a patent false lumen in arcus and descending aorta. Also, complex thoracic diseases are progressing pathologies and therefore the stent will prevent enlargment and retrograde tear on the proximal suture line of the graft.

This proximal suture line contrary to the thoracic endovascular aneurysm repair (TEVAR) prevent both the formation of type Ia endoleak and reduce the risks of paraplegia without affecting the flow of left subclavian artery.[23,24] In this study, there are restrictions due to the limited number of patient groups and the lacking of a long follow-up period. However, even with these data sufficient evidences showing treatment principles were presented and results reflecting literature were obtained. More accurate results will be obtained by enlargement of patient series and randomization of groups.

Frozen elephant trunk procedure, which makes the repair techniques of surgery more feasible in the treatment of complex aortic diseases and provides us to use the combination of surgical and endovascular techniques to reduce complications, is a good alternative method that has acceptable mortality and morbidity rates.

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A personalized version of teflon felt sandwich technique for acute type a aortic dissection

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Abstract

Although, there are important technical developments in surgical repair for acute type A aortic dissection, the surgical intervention still carries some difficulties especially when the aortic dissection spreads to the sinuse of valsalva. Here, a modified version of the felt sandwich technique is described in order to support the entire aortic root externally and overcome bleeding without causing any aortic stenosis.

Keywords: Aortic dissection, ascending aorta, reinforcement

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Introduction

Type A aortic dissection is a highly life-threatening disease often ending in mortality due to aortic rupture and organ malperfusion. Surgical intervention is the only recommended treatment modality in such cases though it still bears unresolved problems causing mortality and morbidity. Although there is an expanded list of considerable surgical obstacles, aortic root repair remains a challenging problem among these surgical difficulties especially when the aortic dissection extends to the sinuse of valsalva. Furthermore, suturing for the anastomosis of the affected and weakened aortic root due to dissection will cause further damage that might result in uncontrollable surgical bleeding. To solve these problems, numerous valuable surgical techniques were introduced including reinforcement with one or two strips of Teflon felt, glue fixation, supporting partial and entire aortic root with graft, and modifications of the latter.[1-7]

There are, however, some advantages and disadvantages in each of these options. In the traditional felt sandwich technique, the dissected aortic layers are reunited between two strips of Teflon felt (8- to 10-mm wide) provided that the coronary ostia are not compromised. In this study, we present a personalized version of the felt sandwich technique in order to support the entire aortic root externally without causing any aortic stenosis.

Technique

Following the cardiopulmonary bypass initiation and cross-clamping, an aortotomy is applied and the ascending aorta is transacted just at the supracoranary level. Regardless of the presence of dissection extending to the sinus of valsalva, aortic root is reinforced with the felt sandwich technique in case there is no aortic valve pathology. Unlike the traditional technique, two Teflon strips with non-identical width is prepared; these two strips are approximately 5-mm wide and 12-mm or wider, respectively **(Figure 1A)**.

Avoiding contact with the origin of the coronary arteries, aortic root is slightly mobilized for the strip application by way of limited excision. The origin of the coronary arteries and surrounding tissues are left untouched in order to prevent potential iatrogenic traumas and further weakening while avoiding strip pressure over the coronary arteries. Then, the wider Teflon strip is placed outside the aortic circumference in order to cover the entire aortic root wall externally. Following this, the 5-mm wide strip is placed inside the aortic circumference. The aortic walls are sandwiched between the felt strips with a horizontal mattress by using 4-0 polypropylene sutures. While placing the horizontal mattress sutures, sutures are applied from the upper side of the outer strip and the mid-point of the inner strip **(Figure 1B, Figure 2)**. While placing the aortic replacement graft, 3-0 polypropylene running sutures

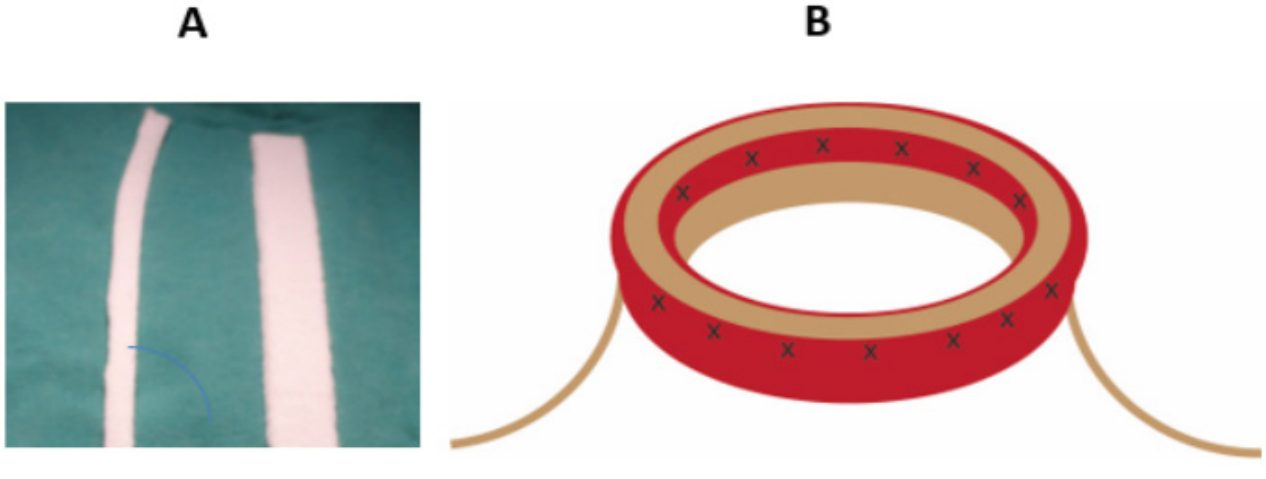


Figure 1: ***(A) Teflon strips with non-identical; approximately 5-mm wide and 12-mm or wider. (B) The thin strip is placed inside the aorta and the horizontal mattress sutures are applied from the upper side of the outer strip and the mid-point of the inner strip.***

pass through the bottom line of the inner strip and the brim of the outer strip, which prevents aortic stenosis caused by curled up inner strip **(Figure 3A)**. In other words, if sutures go through the upper or mid-line of the inner strip instead of stabilizing the bottom of the strip, the strip will eventually bend inwards and cause discrete like stenosis **(Figure 3B)**. As the sutures pass through the upper line of the outer strip, the strip is let reach down to the root base. In this way, the strip externally supports the entire aortic root **(Figure 3A)**.

Discussion

If aortic dissection patients have normal aortic valve with undilated or mildly dilated annulus, surgeons often prefer supracoronary graft replacement due to its technical simplicity and less invasive nature. However, aortic dissection mostly spreads to the aortic root resulting in weakened wall. There may even be additional etiological connective tissue disorders that might further weaken the aortic root wall.

Without one of the reinforcement techniques, proximal anastomosis of this area may cause uncontrollable bleeding and late postoperative aortic root dilatation along with progressive aortic regurgitation. To overcome these problems, many techniques ranging from the simplest methods such as the sandwich technique to more complicated approaches like Florida sleeve technique and its modified versions, which create a neo adventitia, have been suggested to support the aortic root and anastomotic area.[1,2]

Although these techniques offer effective solutions, Florida sleeve technique, its modifications, and similar techniques are time consuming and invasive methods. On the other hand, sandwich technique, simple as it is, may prove to be ineffective as it fails to support the entire aortic root causing surgical bleeding and late root dilatation. Traditionally, the dissected aortic layers are reunited by placing thin felt strips (8- to 10-mm wide) from inside and outside the circumference of the aorta without

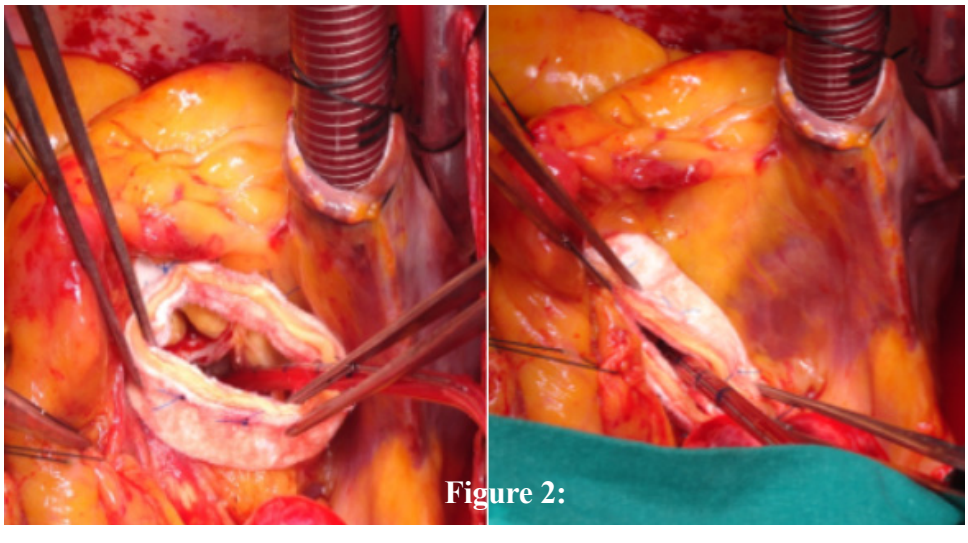
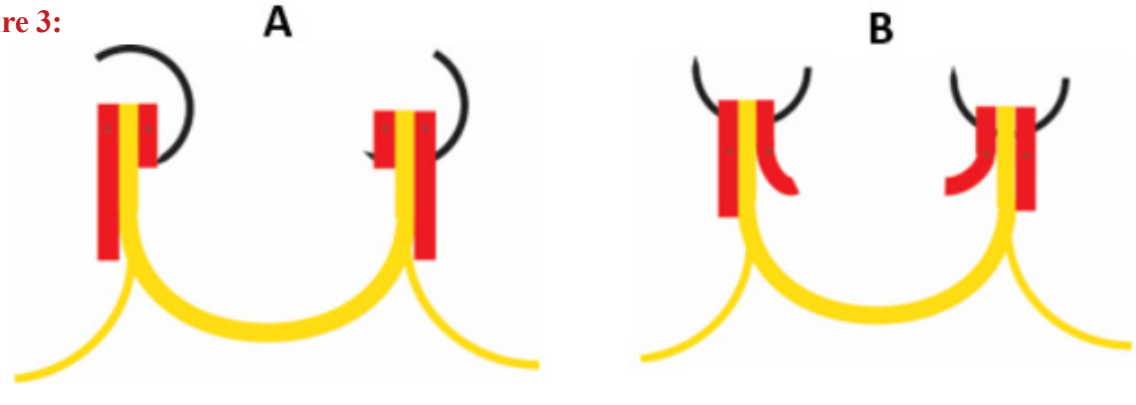


Figure 2: ***Surgical view of the sandwiched aortic root.***

Figure 3: ***(A) Running sutures pass through the bottom line of the inner strip and the brim of the outer strip and so the outer strip reaches down to the root base. (B) If sutures go through the upper or mid-line of the inner strip, the strip will bend.***

Figure 3:



compromising the coronary ostia. In this method, however, the entire aortic root may not be supported.

Furthermore, this method may cause aortic stenosis if running sutures go through the upper or mid-line of the inner strip instead of stabilizing the bottom of the strip, which brings about a curled up inner strip and, therefore, discrete like stenosis. To prevent curling up inner strip I prefer a thinner strip (approximately 5-mm wide) instead of a traditional wider strip and take care to pass sutures through the bottom line of the strip. Safi et al. recommend a technique of interrupted pledgeted horizontal mattress sutures compared to the felt sandwich technique. In their experience, this provides superior stabilization and decreases risk of subsequent aortic stenosis.[8]

In this personalized felt sandwich technique, the aim was to develop the reinforcement effect of the sandwich technique and strengthen the entire aortic root wall externally so as to avoid uncontrollable bleeding and late root dilatation. In this way, the proposed modification also prevents aortic stenosis during surgery. Meanwhile, the original simplicity and applicability of the sandwich technique is preserved as well. This personalized method may also be applied to patients with ascending aortic replacement without dissection disorders.

Conclusion

The suggested modification to the felt sandwich technique is a simple and effective way of supporting the aortic root externally as it also helps avoid bleeding.

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Isolated subpulmonary ring accompanied by infundibular located hypertrophia

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Abstract

Congenital diseases causing obstruction of the right ventricular outflow tract (RVOT) are common, but the isolated subvalvular pulmonary stenosis is a very rare condition. Its diagnosis is obscure because of difficulty of comprehension of cardiac anatomy. We report a case of a 61-year-old female who presented for increasing shortness of breath on moderate exertion. Echocardiography showed an obstruction in the RVOT during systole by a subpulmonary fibrous ring with a mean gradient of 75mmHg through the ring. Under cardiopulmonary bypass, surgical resection was successfully performed. The patient continued to do well on follow-up in the out-patient clinic, 12 months postoperative.

Keywords: Subvalvular pulmonary stenosis, infundibular, hypertrophia, isolated subpulmonary ring.

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Introduction

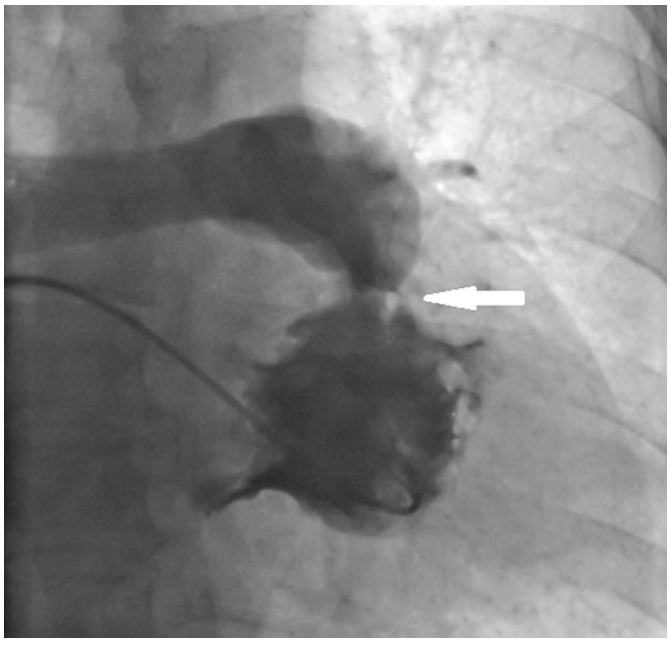
Congenital diseases causing obstruction of the right ventricular outflow tract (RVOT) are common, but the isolated subvalvular pulmonary stenosis is a very rare condition. Its diagnosis is obscure because of difficulty of comprehension of cardiac anatomy. This case deals with clinical features and surgical findings on a lady with isolated subvalvular pulmonary ring.

Case Report

A 61-year-old lady was referred to our institution because of increasing dyspnea on effort NYHA III and two episodes of syncope. Her family history and past history were unremarkable. Examination revealed normal vital signs with systolic ejection murmur at the left sternal border. Her electrocardiogram showed right axis deviation with complete right bundle branch bloc. Chest X-ray revealed an important cardiomegalia without pulmonary congestion.

Transthoracic echocardiography (TTE) showed normal left ventricular ejection fraction, dilation of right heart cavities, and obstruction in the right ventricular outflow tract (RVOT) during systole, causing severe stenosis with a peak gradient of 90mmHg. Right cardiac catheterization showed a severe subvalvular pulmonary stenosis and integrity of the pulmonary leaflets **(Figure 1)**. There were no tricuspid regurgitation.

Figure 1. *Right cardiac catheterization showed a severe subvalvular pulmonary stenosis and integrity of the pulmonary leaflets*



Transoesophageal echocardiography was performed preoperatively and confirmed these findings. The operation was performed through a median sternomomy. On bypass, the infunfibulum was opened longitudinally and an isolated fibrous ring 2cm below the pulmonary valve was found **(Figure 2)**. The pulmonary valve itself was normal. A complete resection of the ring was performed. The postoperative period was uneventful and the patient continued to do well 18 months after surgery.

Discussion

Subvalvular pulmonary stenosis commonly occurs as muscular hypertrophy associated with Tetralogy of Fallot or ventricular septal defect (VSD).[1] Membranous subpulmonary stenosis is rare, and only few cases have been reported, mostly in association with other congenital defects like pulmonary valve stenosis and VSD.[2] Isolated subpulmonary membranes are extremely rare.[3] Kou-Gi Shyu[4] reported 15 patients proved by surgery in a series of 3222 congenital heart diseases. The pathology of the fibrous ring can be related to tricuspid valve tissue or fibrous tags from the inferior vena cava or coronary sinus.[5]

The diagnosis of such a disease can be challenging, especially in adults, because of its rarity and the difficulty of assessing RVOT on TTE. Although echocardiography is the most commonly used non-invasive modality for diagnosing infundibular subpulmonary stenosis, but the detection rate by echocardiography is limited to approximately 70% of patients.[4] More imaging using 3D echocardiography and cardiac CT/magnetic resonance imaging (MRI) is highly recommended before surgical treatment.[6]

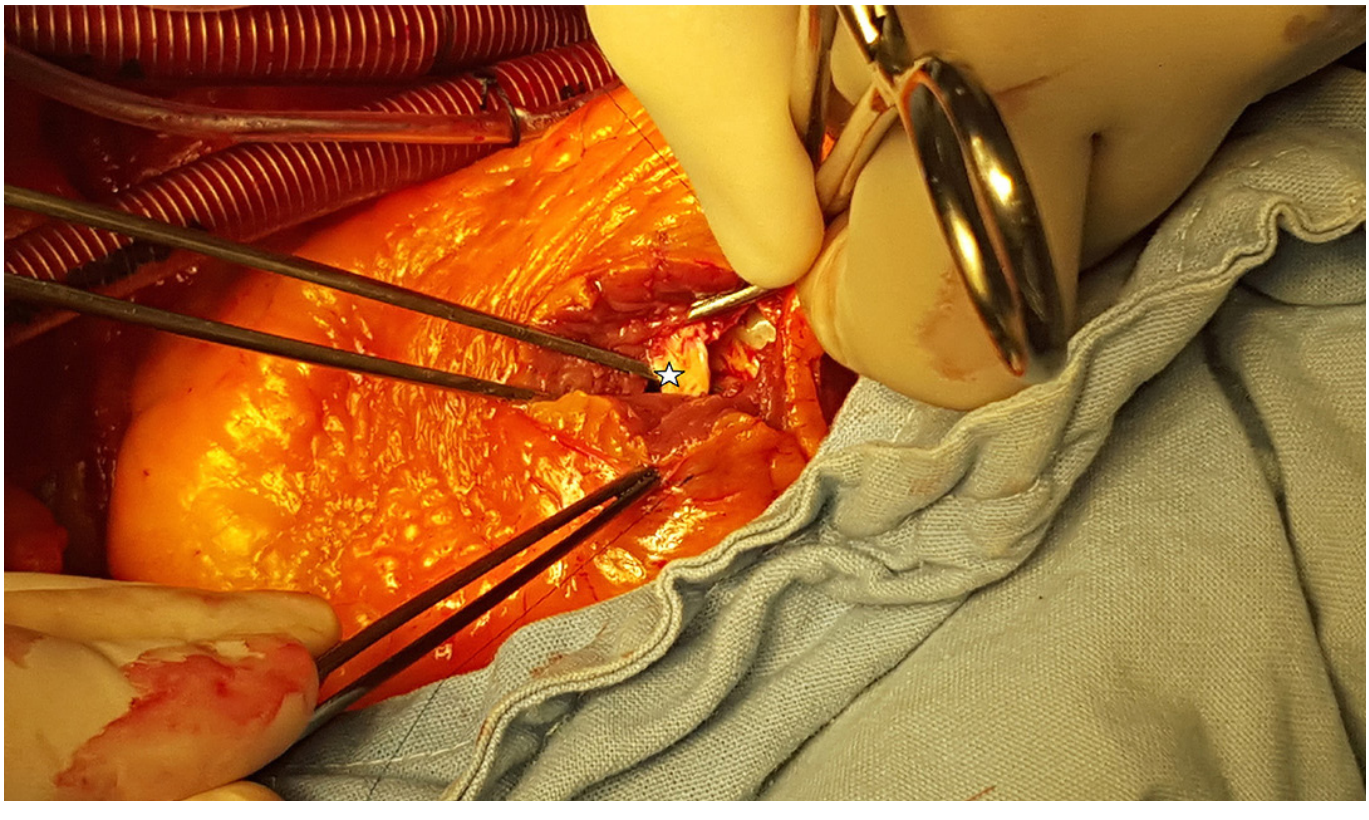
Cine MRI may be more accurate for the detection of infundibular subpulmonary stenosis, but it suffers the limitation that it only provides twodimensional visualization of the cardiac chambers and great vessels. Recently, free-breathing, whole-heart MRI has enabled three-dimensional visualization of not only the cardiac chambers and great vessels but also the coronary artery system with excellent spatial resolution.[7]

Treatment of infundibular stenosis is surgical when there is sufficient hemodynamic compromise. Surgical correction of uncomplicated isolated infundibular pulmonic stenosis under cardiopulmonary bypass is safe.[4] In the series of Shyu K-G and al,[4] there was only one death with a surgical mortality of 6,7%. All surviving patients had remained asymptomatic during the mean follow-up period of 35 months. Although patients can tolerate right ventricular hypertension for long periods of time, the optimal time for surgery is prior to the development of right ventricular failure.

Conclusion

We reported the case of an infundibular pulmonary stenosis associated with an isolated hypertrophy of the right ventricle in a 61-year-old lady.

Figure 2. *On bypass, the infunfibulum was opened longitudinally and an isolated fibrous ring 2cm below the pulmonary valve was found*



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Giant pseudoaneurysm of basilic vein complicating arteriovenous fistula

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Abstract

Arteriovenous fistulae are created for haemodialysis in patients with end-stage renal failure. Due to repeated punctures and concomitant heparinization an iatrogenic pseudoaneurysm is not a rare complication of patients having AVF. A case of a 58-year old patient having a pseudoaneurysm related to his sidetoside brachiobasilic AVF at the left antecubital region is reported in this article.

Keywords: Arteriovenous fistula, pseudoaneurysm, haemodialysis, renal failure

Arteriovenous fistulae (AVF) are created for haemodialysis in patients with end-stage renal failure. One of the complications of AVFs is iatrogenic pseudoaneurysms related to repeated punctures and concomitant heparinization. The incidence of pseudoaneurysms complicating AVF ranges from 2% to 10%.[1]

A 58-year old diabetic, hypertensive patient who had a sidetoside brachiobasilic AVF at the left antecubital region was referred to our clinic with a 4 months history of pulsatile swelling in his left arm **(Figure 1)**.

He had been on hemodialysis for 4 years. Color Doppler Ultrasonography revealed a dysfunctioning fistula created between right brachial artery and basilic vein and a 62 x 55 mm pseudoaneurysm of the left basilic vein. Moreover, venous thrombosis in the proximal portion of the left basilic vein was observed by color Doppler Ultrasonography. The patient underwent surgical repair. Pseudoaneurysm and the AVF was resected, and the defect on the arterial wall was primarily repaired **(Figure 2, 3)**. Postoperative recovery was uneventful.

Development of pseudoaneurysm carries a high risk of AVF failure, thrombosis, infection, and hemorrhage. Treatment options include compression under ultrasonographic guidance, thrombin injection, endovascular cov-

Demirdaş E, Atılgan K., Sevuk U., Çiçekçioğlu F. Giant pseudoaneurysm of basilic vein complicating arteriovenous fistula EJCM 2017; 05 (1): 15-16. Doi: **10.15511/ejcm.17.00115**

Figure 1.

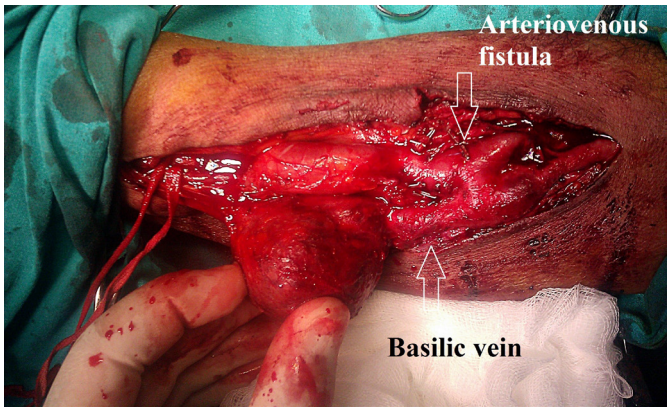

Figure 2.

ered stent implantation and surgical reconstruction.

Autologous AV fistulas have been shown to have superior long-term patency, lower incidence of complications and longer patient survival compared to arteriovenous grafts or central venous catheters. Thus, preservation of the arteriovenous fistula is critical to improved survival. Early diagnosis and prompt management of pseudoaneurysms are necessary to avoid AVF failure. [2, 3]

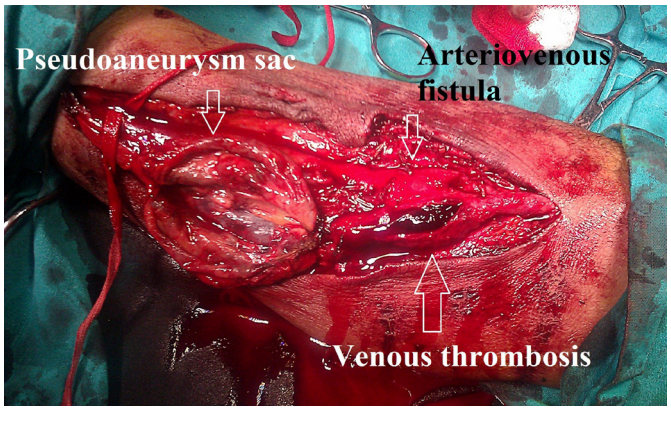

Figure 3.

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The first report of pseudoephedrine induced posterior fascicular left ventricular tachycardia

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Abstract

Immediate diagnosis and prompt treatment of wide QRS-complex tachycardia is vital. Differential diagnosis of wide QRS tachycardia is also challenging. The most common cause of wide QRS-complex tachycardia is ventricular tachycardia (VT). Idiopathic fascicular left ventricular tachycardia is a rare form of VT, and observed often in young and individuals without underlying heart disease. Clinical presentations are recurrent episodes of palpitations and dizziness without a trigger factor. The paper introduces a case of sustained posterior fascicular left ventricular tachycardia triggered by pseudoephedrine.

Keywords: Pseudoephedrine, posterior fascicular, left ventricular tachycardia

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Introduction

Patients presenting with ventricular tachycardia (VT) often have underlying structural heart disease. [1] VT observed in patients without structural heart disease is called idiopathic VT.[2] Idiopathic VTs is mainly divided into two groups according to ventricular origin; repetitive monomorphic VT (also called right ventricular outflow tract tachycardia) and idiopathic left VT.[1] Fascicular idiopathic left VT (IFLVT) constitutes 10-15% of all idiopathic VT.[3] It has been suggested that reentry mihgt be the mechanism responsible for IFLVT.[3] Frequently posterior fascicle constitutes retrograde arm of the reentry loop (P-IFLVT).[3] P-IFLVT is characterized by relatively narrow QRS, right bundle branch block, left axis deviation, and verapamil sensitivity.[4]

Case

40 years old male with no known chronic heart disease was admitted to the emergency department because of palpitations. The patient had used cold medicine containing paracetamol and pseudoephedrine within the same day. Electrocardiogram (ECG) revealed wide QRS-complex tachycardia (206/bpm). Although the patient was hemodynamically stable, the tachycardia primarily was considered as VT. First, 300 mg amiodarone was administered intravenously but the tachycardia sustained. Repeated biphasic electrical cardioversion (CV) with 100-200 joules was performed due to resistant and sustained tachycardia, but failed. CV was repeated after intravenous administration of 5mg lidokain but again failed. Then 3 g of magnesium sulfate (150 mg/min) and 5mg metoprolol was administered intravenously. The tachycardia rate decreased (116/bpm) but still sustained **(Figure 1)**. Finally sinus rhythm was restored spontaneously **(Figure 2)**. Detailed evaluation of 12-lead ECG demonstrated the wide QRS-complex tachycardia with right bundle branch block morphology and left axis deviation and was found to be P-IFLVT. The patient was assessed by echocardiography and coronary angiography electively. There was no structural heart disease. Electrophysiological study was recommended and was performed. A left ventricular posterior fascicular ventricular tachycardia (tachycardia cycle length of 390 ms) was induced by the programmed stimulation (500/350/200 ms). Radiofrequency ablation was done successfully with retrograde approach. The patient was discharged with 100 mg acetylsalicylic acid for 1 month.

Discussion

There are four conditions that can cause wide QRS-complex tachycardia: VT, antidromic atrioventricular tachycardia, supraventricular tachycardia with aberrant conduction, and ventricular pacing.[1] The most common

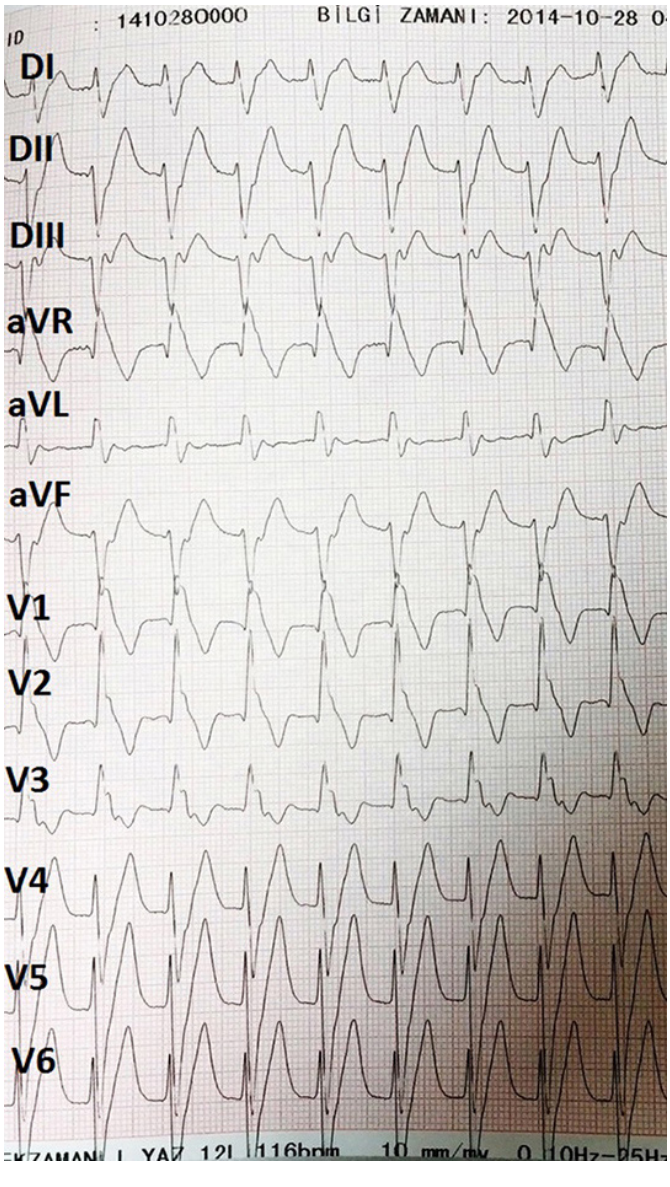

Figure 1: *The 12-lead electrocardiogram demonstrates the posterior fascicular idiopathic left ventricular tachycardia with right bundle branch block morphology and left axis deviation.*

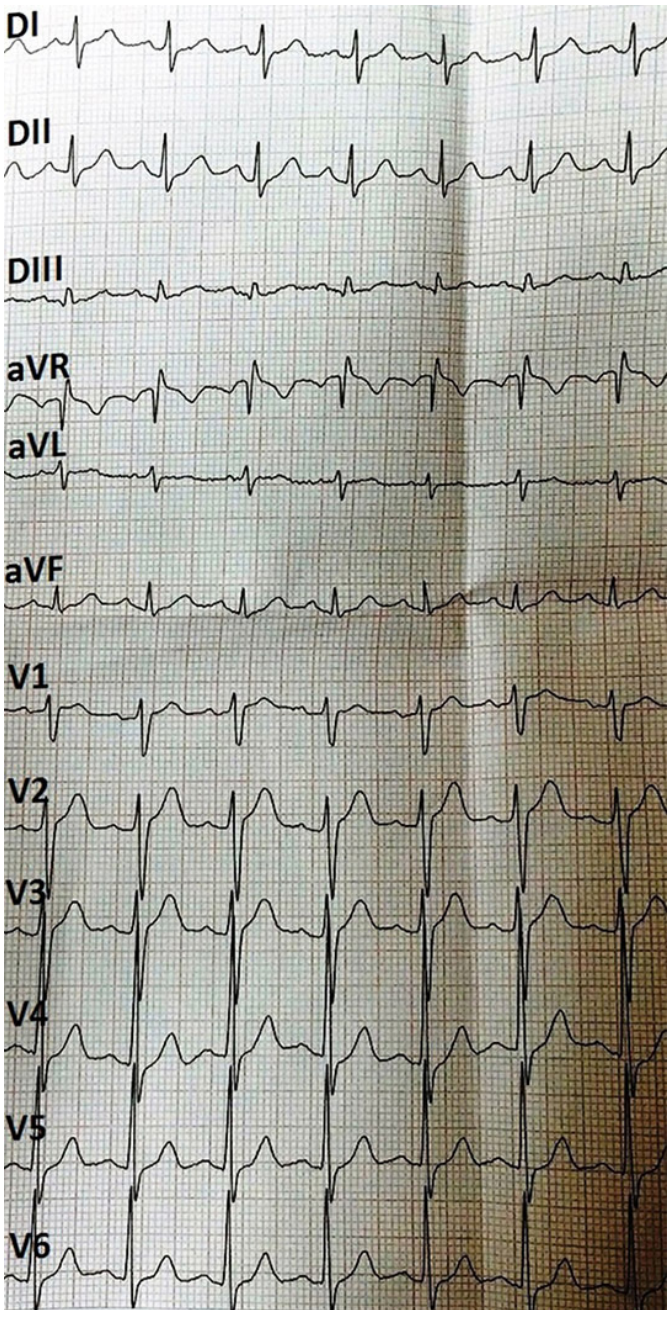

Figure 2: *The electrocardiogram shows the sinus rhythm after successful electrical cardioversion*

cause of wide QRS-complex tachycardia (70-80%) is VT.[1] Clinical status of the patient presenting with VT is often not stable.[1] However, the stable clinical situation never rules out diagnosis of VT.[1] Therefore, the patients with wide QRS-complex tachycardia should be considered as VT until proved otherwise, irrespective of the clinical condition. Various algorithms have been developed to be used in differential diagnosis of wide QRS-complex tachycardia.[5] But the implementation of these algorithms is complex and time consuming in emergency conditions.

Antidromic atrioventricular tachycardia, supraventricular tachycardia with aberrant conduction and VT were considered in the differential diagnosis of the tachycardia due to stable clinical condition of the patient, no known structural heart disease and the patient's age. [1] There were no concordance, dissociation, fusion and capture beats, but the absence of these did not exclude the diagnosis of VT. Right bundle branch block QRS duration> 140 ms, R / S ratio in V6 <1, the presence of R wave in aVR were evaluated as findings in favor of the VT.[1] Finally the diagnosis of P-IFLVT was confirmed by the right bundle branch block with left axis deviation.

Most patients with common cold use systemic decongestant agents especially during the winter months. These agents, even bring some symptomatic benefit, sometimes serious arrhythmias were reported.[6] Pseudoephedrine is one of these agents commonly used.[1] Even though the patients with an underlying heart disease are more prone to cardiac arrhythmias, arrhythmias may occur in patients with no known heart disease.[1]

To the best of knowledge it's the first reported pseudoephedrine induced P-IFLVT. The differential diagnosis of wide QRS-complex tachycardia is crucial for prompt, accurate and efficient approach.

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Manuscripts should be organized as follows:

(a) Title page; (b) Abstract and Key words; (c) Text with the following sections (not applicable for article types with unstructured abstracts): Introduction, Materials and Methods, Results, Discussion, Acknowledgement (optional), Funding statement, Conflict of interest statement, (d) Figure (and Video) legends; (e) Tables; (f) References.

Title page (1st page): Title: should be brief and descriptive (100 characters) - no abbreviations are allowed, even if well known.

Authors: list all authors by full first name, initial of or full middle name and family name. Qualifications are not required. Ensure the author names correspond (in spelling and order of appearance) with the metadata of the system

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Abstract (2nd page): An abstract should be a concise summary of the manuscript. Reference citations are not allowed. The abstract should be factual and free of abbreviations, except for SI units of measurement.

Keywords: Following the abstract, 3-6 keywords should be given for subject indexing.

Introduction: Should state the purpose of the investigation and give a short review of pertinent literature.

Materials and methods: Should be described in detail with appropriate information about patients or experimental animals. Use of abbreviations renders the text difficult to read; abbreviations should be limited to SI units of measurement and to those most commonly used, e.g. VSD, ASD, CABG (abbreviations should not be included in headings and extensions should be included at first mention).

Results: Results should be reported concisely and regarded as an important part of the manuscript. They should be presented either in tables and figures, and briefly commented on in the text, or in the text alone. Repetition of results should be avoided!

Discussion: The discussion is an interpretation of the results and their significance with reference to pertinent work by other authors. It should be clear and concise.

Acknowledgement: Acknowledgements and details of non-financial support must be included at the end of the text before the references. Personal acknowledgements should precede those of institutions or agencies.

Tables: All tables must be included in the manuscript file, should start on separate pages and be accompanied by a title, and footnotes where necessary. The tables should be numbered consecutively using Arabic numerals. Units in which results are expressed should be given in parentheses at the top of each column and not repeated in each line of the table.

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Files should be prepared as a Word document using font size 12 Times New Roman characters, double-spaced and with 2.5 cm margins on each side, top and bottom. Only standard abbreviations should be used; other shortened phrases should be indicated in parentheses as used in the text. Generic or chemical names of drugs should be used instead of trade names.

ETHICAL ISSUES

Publishing responsibilities of authors and Ethics

The publication of an article in a peer-reviewed journal is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of work of the author and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behavior.

Reporting standards

Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable. Review and professional publication articles should also be accurate and objective, and editorial 'opinion' works should be identified as such.

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If the work involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, the author must clearly identify these in the manuscript. If the work involves the use of animal or human subjects, the author should ensure that the manuscript contains a statement that all procedures were performed in compliance with relevant laws and institutional guidelines and that the appropriate institutional committee(s) has approved them. Authors should include a statement in the manuscript that informed consent was obtained for experimentation with human subjects. The privacy rights of human subjects must always be observed.

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contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

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This policy concerns the addition, deletion, or rearrangement of author names in the authorship of accepted manuscripts. Before the accepted manuscript is published in an online issue:

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Original articles should consist of sections titled as “Abstract, Introduction, Materials and Methods, Results, Discussion and Conclusion”. For information about the abstract, refer to ‘Manuscript Formatting’ section.

The Introduction section of the manuscript should clearly state the purpose of the manuscript and include a brief summary of the most relevant national and international literature stating the main purposes and research question of the study. Contradictory aspects of the research, if present, should be mentioned. The expected contribution of this study to family medicine and practice should be highlighted.

The Materials and Methods section should describe the study population and the study design, with adequate information on the techniques, materials and methods used. The section should include information of the study type, population, sample, sample size and selection of the sample. Validity and reliability of scales and questionnaires used also should be referred to. A clear description of the statistical methods should also be given.

The Results section should include a detailed report on the findings of the study. All figures, tables and illustrations should be used in this section. Results should be presented either as text or figures and/or tables and not be replicated.

The Discussion section of the study should emphasize the importance of the results and compare them with the results of other authors with relevant citations from the most recent literature. Study limitations and strengths should be specified. Suggestions for further studies in this area should be added.

The Conclusion should include the main conclusions based on the results of the research, emphasize the contributions of the study to family practice and propose original suggestions. A brief revision of all the results and the discussion should be avoided.

Original articles excluding case reports and systematic reviews should not exceed 3000 words excluding the abstract, references and tables. Case reports should not exceed 1000 words excluding the abstract, references and tables. There are no restrictions for systematic reviews.

Short Reports

Short Reports are accepted when the research topic, aim and results of the study are in limited in scope and in cases that do not require writing a full original article. Short Reports can be described as a summarized version that have been prepared according to the structure of research articles. Publishing an article as a short report does not reflect a lower quality. The same rules as relevant to original articles apply to preparing a short report, but structured abstracts are not mandatory references and tables should not exceed 6 and 2 in number, respectively. Abstracts should not exceed 100 words and the text should be restricted to a maximum of 1000 words.

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Letters to the editor or comments can be sent to provide commentary and analysis concerning an article published in the journal, to give information about ongoing research, to provide informa-

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Manuscripts should be designed in the following order:

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Abstract
Main text
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Tables, figures and illustrations

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The title page of the manuscript should include: The title, first and last names of each author. Complete affiliation and title for each author, with the name of department (s) and institution (s) to which the work should be attributed.

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Abstracts hould be exact in English, with a minimum of 150 and maximum of 350 words. Abstracts of original research articles should be structured under subheadings as follows: objectives, methods, results and conclusion. A maximum of 3 key words should be added to English abstracts.

Text

The text contains the rest of the manuscript. It is structured differently according to the type of manuscript (original research article, review, etc.). For example, original research articles should consist of aim and objectives, methods, results, discussion and conclusion.

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