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SICKLE CELL CHILD**

Anelechi B. Chukuezi and Jones N. Nwosu

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Syed Ansar Ahmad, Saif Khan and Mohd. Sami Ahmad

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AN UNCOMMON CASE OF DISSECTING ABDOMINAL AORTIC ANEURYSM: CLASSICAL SONOGRAPHIC APPEARANCES

*Erondu Okechukwu Felix, **Ugwu Anthony Chukwuka and **Okoro Richard Chinedum

*Department of Clinical Imaging, Image Diagnostics Port Hacourt, Nigeria

**Department of Radiography and Radiological Sciences, Nnamdi Azikiwe University, nnewi Campus, Anambra State, Nigeria

E-mail address for correspondence : tonybullng@yahoo.ca

Abstract: *There is limited information on the classical sonographic appearances of a dissecting abdominal aorta in a patient with pre-existing large aneurysm. A case of a 69year old female patient with anterior wall dissection in a 6.0cm, mid abdominal aortic aneurysm is presented. The patient with history of un-managed hypertension and vague abdominal discomfort, had an aneurysm stretching from below the origin of the Superior mesenteric artery to just above the iliac bifurcation. Our patient was in very stable condition and unaware of the severity of her condition. There was no evidence of rupture despite obvious intravasation into the dissected wall of the aneurysm. Whereas a multi-detector CT angiogram remains a gold standard, the wide availability, easy access and low cost of color Doppler ultrasound are potential benefits especially in developing countries, with poor health infrastructure. The classical sonographic appearances presented in this case, may be sufficient to make the diagnosis when other imaging modalities are unavailable.*

Keywords: *Sonographic, color Doppler, aortic aneurysm, dissection, diagnosis*

INTRODUCTION

An aortic aneurysm is a general term for any swelling(dilatation) of the aorta, usually represents an underlying weakness in the wall of the aorta at that location. While the stretched vessel may occasionally cause discomfort, a greater concern is the risk of rupture, which causes severe pain , massive internal haemorrhage and without prompt treatment, results in quick death. The physical change in the aortic diameter can occur secondary to trauma, infection, an intrinsic defect in protein construction of the aortic wall or due to progressive destruction of aortic proteins by enzymes.

Aortic dissection is a life threatening condition where an opening in the inner lining of the aorta allows blood to flow into the wall of the aorta. The pressure of the blood in the wall can cause the opening in the lining to increase.

The size of the aorta decreases with distance from the aortic valve in a tapering fashion. The normal aorta is regarded to be less than 3.0cm in diameter. The normal range has to be corrected for age and sex as well as daily workload.(*Erbel R, Eggebretch H. Heart 2006*)

The prevalence of abdominal aortic aneurysm increases with age, with an average of 65-70 at the time of diagnosis. There is a large risk of rupture once the size has reached 5cm, though some aortic aneurysms

may swell over 15cm in diameter before rupturing. (www.wikipedia-org . Accessed 8/10/09) Risk factors generally include smoking, hypertension, high cholesterol, male gender, emphysema, obesity and genetic predisposition (WWW.medlineplus. Accessed 12/10/09)

We present a rare case of dissecting aneurysm which exceeded 5cm in a stable patient.

SUBJECT AND METHODS

Case Report: Our patient is a 69year old female with a history of longstanding hypertension and feeling of abdominal swelling over the past 2 years. She was admitted into a private clinic following complaints of a two weeks vague abdominal pain. Her blood pressure was 170/115mmHg, pulse rate of 77bpm. Patient was not on any anti-hypertensive prior to admission. No other symptoms were recorded. Physical examination revealed a fluctuant abdominal mass and patient was referred for an abdominal ultrasound to confirm presence and nature of mass. Her stable condition apart from the obvious hypertension masked the severity of her immediate condition. A digital ultrasound machine ACUSON 500 by Siemens Ag Germany was used for the investigations. The machine is equipped with color Doppler modes and multi-frequency sector, volume as well as probes for vascular studies. The caliper calibrated for an assumed sound velocity of 1540ms⁻¹ in soft tissue. Accelerating voltage equal to or less than 20KV with a mains input frequency of 50Hz. The investigations were performed with 3.5 – 5.0MHz transcutaneous probes. The linear vascular probes have frequency range of 5- 13MHz.

RESULTS

Sonographic findings:

A huge pulsatile intrabdominal swelling representing a dilated mid-abdominal aortic aneurysm was identified. The aneurysm is below the origin of the superior mesenteric artery and stretches a distance of over 5.6 cm length and terminates before the bifurcation of the iliac arteries. The maximum diameter before the aneurysm was 2.5cm, while the aneurysm measured approximately 6.0cm in its widest portion. There was anterior wall intimal dissection which coexists with the aneurysm and thickness of the dissecting wall measured 4.3mm. Doppler studies revealed severe turbulence along the aneurismal lumen as well as confirms intravastation into the wall of the dissected aorta. There was no evidence of rupture and no haemo-peritoneum was noted.

An abdominal CT was suggested but not done as patients could not afford to pay for it.



Fig. 1 : origin of the aneurysm, below the SMA junction

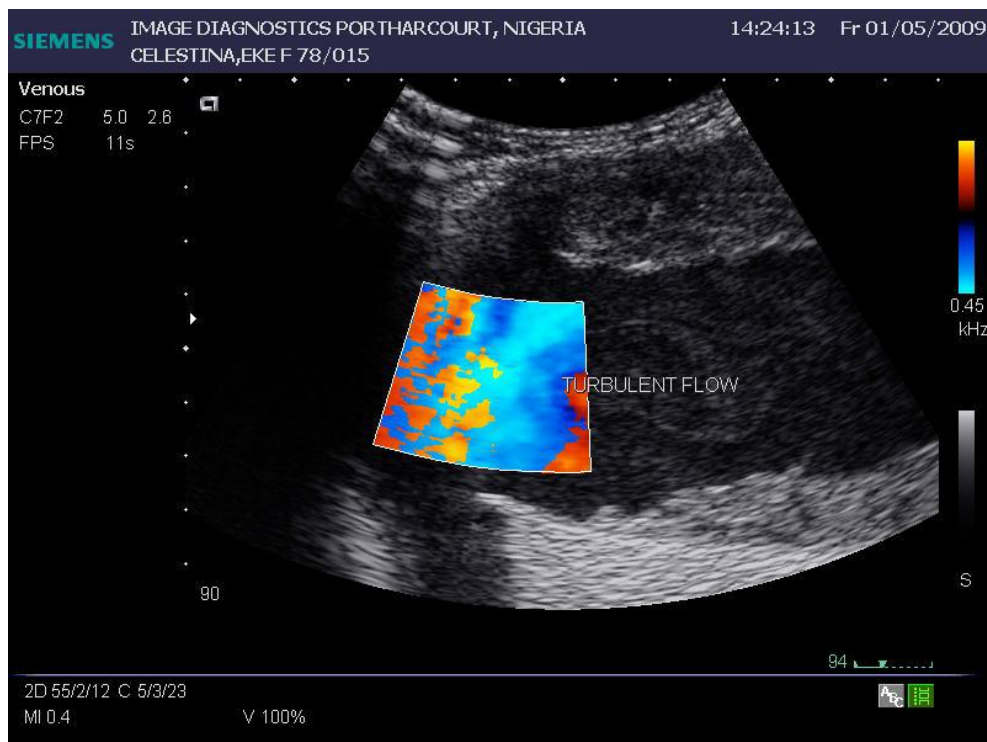
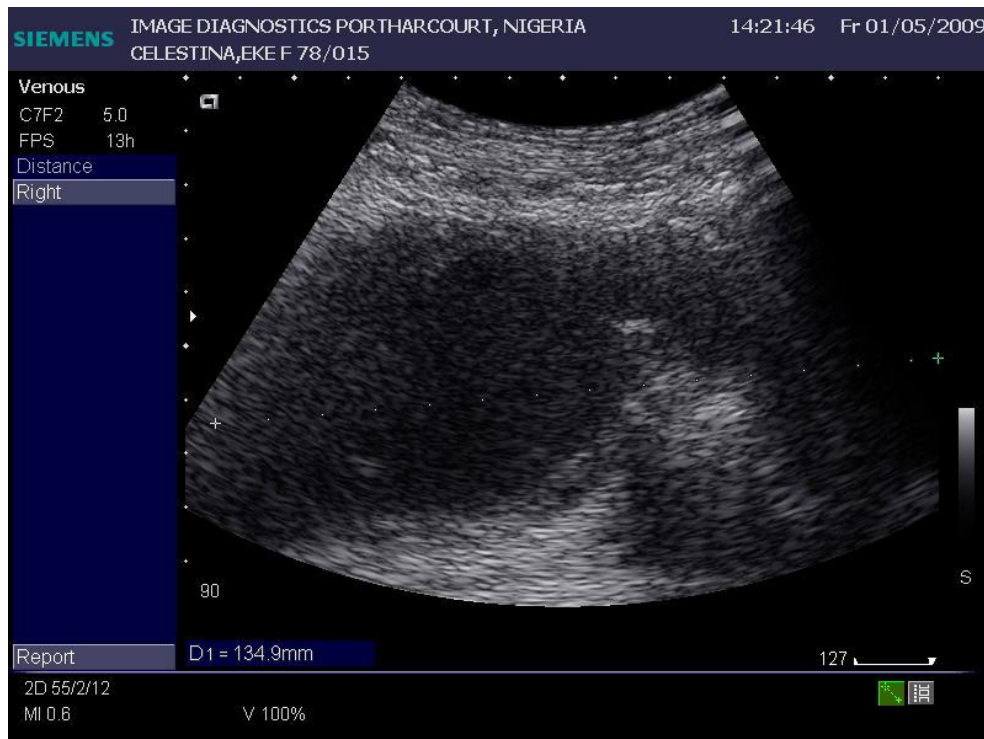


Fig 2: Turbulence along the lumen of the aorta with color flow mapping



Fig 3: Shows the aneurismal dilatation



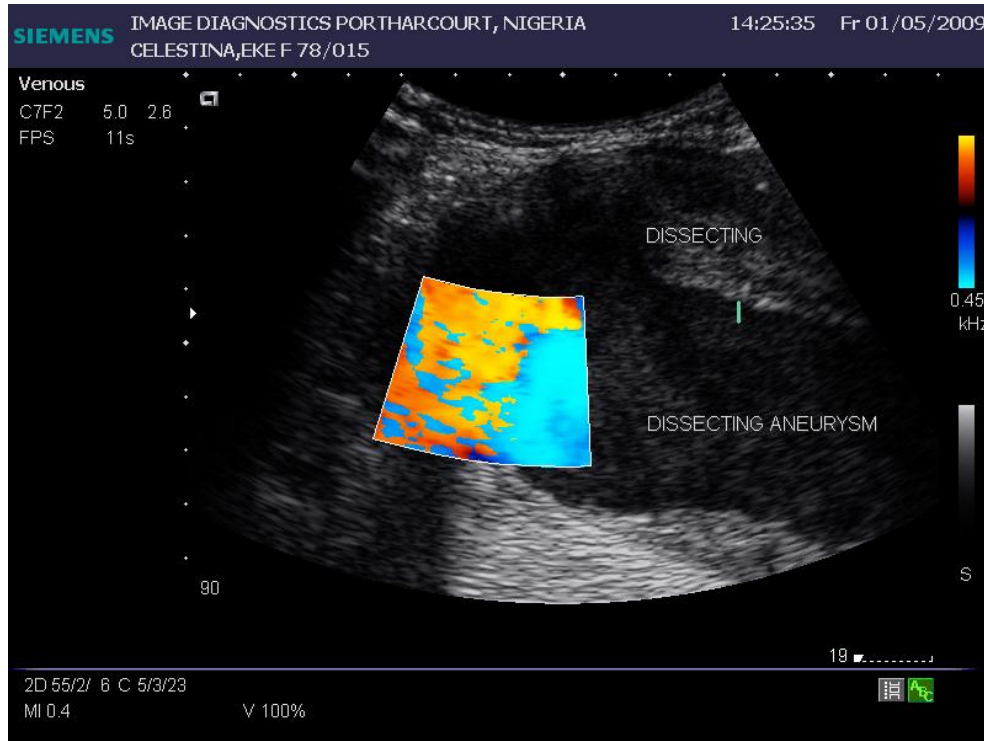


Fig 4: Dissection of the intimal layer of the anterior wall of the aorta



Fig 5: Evidence of intravasation into the wall of the aorta

DISCUSSION AND CONCLUSION

Imaging plays a critical role in the confirmation and diagnosis of abdominal aortic aneurysm. Various modalities such as conventional chest radiography, angiography, computed tomography and MRI may all be diagnostic of aortic aneurysm. (*www.e-radiography.net. Accessed 12/10/09*) Aortic dissections and rupture are some of the most important non-traumatic aortic emergencies and prompt diagnosis markedly improves morbidity and mortality in such cases. Multi-detector CT is the imaging of choice, even though MRI has shown high sensitivity in evaluation of dissections, but may have limited use in the emergency department (*Missiroli C, Singh AK., 2008*)

Our case has however shown the pivot role of color Doppler sonography in the diagnosis of abdominal aortic dissections especially in the developing countries where CT and MRI are not easily accessible and may be too expensive for rural and poor patients such as ours. Primary dissections of the abdominal aorta are rare (0.4-4%) of aortic dissections and most cases are traumatic (accident or iatrogenic) in origin (*Andrea S, Mauro G, Patrizia B, Tiziano C, et al., 1990*)

Our patient has no history of accident and presents with none of the common symptoms such as hemoptysis, shortness of breath, nausea, vomiting, fainting, difficulty in swallowing or headache (*www.e-radiography.net. Accessed 12/10/09*)

Our case further confirms the observations of Scaglione et al, that a large percentage of patients (30%) ultimately diagnosed with acute dissections are first thought to be suffering from something else (*Scaglione M, Salvolini L, Casciani E, Giovagnoni A, Mazzei M et al., 2008*)

Aortic diameter is considered to be a marker of risk. The critical diameter is considered to be 6cm for ascending and 7cm for the descending aorta, beyond which rupture or dissection is imminent (*Hahn R, Romas M, Mogtader A, et al., 1992*). Aortic dissections have been reported at aneurysmal widths of 4- 5cm in a 32 year old (*Linett L., 2005*) our case reached a diameter of 6.0cm before dissection.

Furthermore, aortic dissections into a pre-existing aneurysm in a stable asymptomatic patient as noted in our case is a rare occurrence. Jacobs DL et al (*Jacobs DL, Freischlag JA, Seabrook GR, Towne JB., 1994*) have reported a near similar case, in an 8.0cm aneurysm, but whose diagnosis was made with a CT. There is no available literature on ultrasound diagnosis of this scenario.

Aortic dissection is gaining recognition in Western societies and it is being diagnosed with increasing frequency. New diagnostic modalities, increase life expectancy, and the increase in number of hypertensives have contributed to the growing awareness of aortic dissection. (*Scaglione M, Salvolini L, Casciani E, Giovagnoni A, Mazzei M et al., 2008*)

In our environment, where access to sophisticated diagnostic tools may be limited, the potential risk of abdominal aneurysms and consequent dissection must be recognized even in asymptomatic hypertensives. Literature has shown that this is uncommon before the sixth decade and often combined with proximal disease. (*Muluk SC, Gertler JP, Brawster DC, et al., 1994 and Lederle FA, Johnson GR, Wilson SE, et al., 2000*). Our patient was 69 years and further confirms the earlier findings.

Finally, the role of ultrasound in this diagnosis should be exploited in developing countries, due largely to its wide availability, easy access and low cost.

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CONCURRENT EPISTAXIS AND SUDDEN AND TOTAL HEARING LOSS IN A SICKLE CELL CHILD

Anelechi B. Chukuezi and Jones N. Nwosu
Department of Otolaryngology,
Imo State University Teaching Hospital, Orlu Imo State, Nigeria
E-mail address for correspondence: fortbarn@yahoo.com

Abstract : *Sickle Cell Disease (SCD) is a group of inherited disorders of haemoglobin of which Sickle Cell Anaemia (HbSS) is the most well known. Complications will depend on the organs involved. SCD is associated with multisystemic complications caused by the resultant vaso-occlusive state which create a multitude of diagnostic considerations. To report the case of concurrent epistaxis and sudden and total hearing loss in a sickle cell child because of the rarity of these combination of complications as well as a brief literature review We present a case of a male sickle cell child who presented with complaints of severe epistaxis, sudden and total hearing loss in the right ear, fever, pains and swelling of both right and left upper and lower limbs as well as in the right upper hypochondrial region and abdominal distension which all started the day before presentation. He was a known sickler. On examination the child looked sickly, febrile and very pale. There was tenderness of the upper and lower limbs and massive splenomegaly. The temperature was 37.6 ° C; pulse 128/minute and respiration was 40/minute. The haemoglobin level was 4gm %; blood group O+ and genotype HbSS. Blood film showed one (+) of malaria parasites.. Epistaxis and sensorineural hearing loss are recognized complications of sickle cell disease but the concurrent occurrence of these two complications in sickle cell disease patient in crisis is a rarity.*

Key Words: *sickle cell, epistaxis, hearing loss, concomitant, complications*

INTRODUCTION

Sickle Cell Disease (SCD) is a group of inherited disorders of haemoglobin of which Sickle Cell Anaemia (HbSS) is the most well known. (Frenette, PS, Atweh, GF, (2007) and Anionwu, EN, Jubril HB, 1986). SCD was first described by Herrick in 1910, in a dental student who presented with pulmonary symptoms. He coined the term “sickle-shaped” to describe the peculiar appearance of the RBC in this patient (Herrick JB, 1990). The haemoglobin in sickle cell anaemia (HbSS) differs from normal adult haemoglobin (HbAA) only by the substitution of valine for glutamic acid in the sixth position of the B-globulin polypeptide (Frenette, PS, Atweh, GF, 2007), and Ingram, VM, Abnormal human haemoglobins) Anionwu and Jubril I noted that sickle cell anaemia is found in one out of 300 babies of Afro-Caribbean origin and one in 500 black Americans. In Nigeria, two out of every 100 babies have sickle cell anaemia (Lesi FEA, 1985) Sickle cell haemoglobinopathy is a multi-organ disease (Frenette, PS, Atweh,

GF, 2007). Complications will depend on the organs involved. This paper is a case report of simultaneous epistaxis and sudden and total hearing loss in a sickle cell child. This case is being reported because of the rarity of concurrent or simultaneous epistaxis and sudden and total hearing loss as complications in sickle cell disease.

CASE REPORT

A seven year old male child C A was admitted into the children's ward of Imo State University Teaching Hospital, Orlu, Nigeria on 6/1/2007 after he was seen in the accident and emergency department. He presented with complaints of severe epistaxis, fever, pains and swelling of both right and left upper and lower limbs as well as in the right upper hypochondrial region; abdominal distension and sudden and total loss of hearing in the right ear which all started the day before presentation. He was a known sickler. On examination the child looked sickly, febrile and very pale. There was tenderness of the upper and lower limbs and massive splenomegaly. The temperature was 37.6 ° C; pulse 128/minute and respiration was 40/minute. The haemoglobin level was 4gm %; blood group O+ and genotype HbSS. Blood film showed one (+) of malaria parasites. Diagnosis of Sickle Cell Anaemia in crisis was made. The patient was packed with vaseline gauze to arrest the bleeding and transfused in the accident and emergency department before admission into the children's ward. Audiogram done on the child while on admission showed no response in the right ear and average of 40dB loss in the left ear. The crisis was thought to have been precipitated by malaria infection. The child was treated with antimalarial drug, folic acid and analgesic. Post transfusion haemoglobin after the epistaxis was arrested was 7.2gm%. The crisis abated and the child was discharged on 12/1/2007 and followed up in the out-patients clinic. After follow up for one year the child did not recover his hearing in the right ear but recovered hearing in the left ear.

DISCUSSION

SCD is associated with multisystemic complications caused by the resultant vaso-occlusive state which create a multitude of diagnostic considerations. In the musculoskeletal system, likelihood is high for avascular necrosis of the femoral humeral head, as a consequence of skeletal infarcts, and also for leg ulceration and osteomyelitis; in the eyes, the incidence of proliferative retinopathy is high; in the urinary tract, dehydration is common, and causes for renal failure are many; in the pulmonary system, pneumonia is of prime concern, as are sickle cell chest syndrome (from occlusion within the microvasculature of the lung) and the deadly sickle cell chronic lung disease, for which pulmonary function tests are important in early asymptomatic stages.*(Childs, JW, 1995)*. 40% of young adults develop Cholelithiasis. 11% of patients with SCD will develop clinically apparent stroke by age of 20 years going up to 25% by the age of 45 years *(Frenette, PS, Atweh, GF, 2007)* Sickle cell hepatopathy, and rheumatologic and immunologic diseases can occur concomitantly with sickle cell disease *(Onuba O, 1991)*. Epistaxis has been reported as a complication of SCD *(Konotey-Ahulu, FID, 1965 and Urvashi, R; Rai Zada, RM; Chaturvedi, VM, 1999)* while hearing loss have been reported in some studies, but a concomitant and simultaneous complication of epistaxis and sudden and total hearing loss has not yet been reported. Iseh et al reported that sickle cell disease was responsible for 1.4% of causes in their study.*(Iseh, KR, Muhammad, Z, 2008)* Blood diseases, of which SCD is one of them, were found to be responsible for 8% of cases of epistaxis in a study by Urvashi et al *(Urvashi, R; Rai Zada, RM; Chaturvedi, VM, 1999)* while Ogura and Senturia *(Ogura JH., 1949)* in their study found 8.8% of epistaxis caused by blood disorder. The mechanism for causation of epistaxis in SCD is not clearly understood. SCD has been associated with varying degrees of sensorineural hearing loss in a significant proportion of subjects *(Friedman EM, Luban NLC, Herer GR, Williams I., 1980)*. Sensorineural hearing loss (SNHL) is a known complication of sickle cell disease (SCD). The frequency of this complication was variable, ranging from 12% to 29% *(Friedman EM, Luban NLC, Herer GR, Williams I., 1980 and Mgbor, N; Emordi F, 2004)*. In a study by Odetoynbo et al *(Odetoynbo O, Adekile A., 1987)* at Ife, Nigeria 12 out of 56 sickle cell (21.4%) subjects demonstrated mild to moderate hearing loss which appeared to be cochlear and retrocochlear in nature. They postulated that anaemia and vasocclusion were to blame. Another study by Ogisi et al *(Mgbor, N; Emordi F, 2004)* at Benin, Nigeria of the auditory function of 30 sickle cell disease patients showed higher mean pure tone hearing threshold at most frequencies when compared to a control group. This higher threshold was blamed on inner ear sensorineural

deafness due to lifelong vaso-occlusion of some of the micro-vasculature supplying the inner ear apparatus in sicklers. There is no doubt that many studies have confirmed that most sickle cell patients have reduced hearing when compared with normal haemoglobin (AA) subjects. In the reported case the hearing loss was sudden and total in one ear with a 40dB loss in the other ear. The sudden and total hearing loss in the right ear is likely due to vaso-occlusion during crisis. Any tissue of the body may be the site of infarction. Deoxygenation of haemoglobin in the capillaries favours the polymerization of HbSS and sickling. Sickle cells become rigid and unable to distort like normal red blood cells when they pass through the capillaries. These cells block the capillaries causing infarction. These sickled cells block the capillaries causing infarction. This is followed by endothelial damage, thrombosis and further damage to the flow of blood. There is necrosis of tissue distal to the infarct damaging the organ or tissue. In this particular case the cochlear branch of the right internal auditory artery may be the likely vessel occluded. Precipitating factors in this occlusive or infarctive crisis include infections especially malaria, cold, fatigue and stasis (Herrick JB, 1990). In the particular case reported malaria is the precipitating factor. Sudden deafness has also been reported in connection with this condition, although in some cases hearing will return. Unilateral high frequency hearing loss was found in three patients but persisted in only one in the study by Samy et al (Samy Elwany, MD *, Tarek Kamel, MD, 2009) while in the study by Al-Dabbous et al 21% of their patients who had SNHL completely recovered (Al-Dabbous, IA; Al Jam'a AH; Obeja, SK; Murugan, ANR;Hammad, HA, 1996). Some published series have reported spontaneous recovery rates for patients with sensorineural hearing loss ranging from 47% to 63% (Al-Dabbous, IA; Al Jam'a AH; Obeja, SK; Murugan, ANR;Hammad, HA; 1996 Sensorineural). Some researchers have suggested the reversibility of this complication particularly in mild to moderate sensorineural hearing loss but not in cases of total loss of hearing as observed in our case. Diagnosis of sensorineural hearing loss does not mean that these patients will have permanent sequelae

CONCLUSION

Epistaxis and sensorineural hearing loss are recognized complications of sickle cell disease but the concurrent occurrence of these two complications in sickle cell disease patient in crisis is a rarity.

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BUCCAL FAT PAD RECONSTRUCTION OF ORAL MUCOSA IN LEUKOPLAKIA

*Dr Syed Ansar Ahmad, **Dr Saif Khan and ***Dr Mohd. Sami Ahmad,

*Lecturer in Oral and Maxillofacial Surgery Chandra Dental College and Hospital Sasedabad Lucknow, UP, India

**Lecturer in Periodontology Dept. of Periodontics and Community Dentistry DR Z A Dental College and Hospital Aligarh Muslim University Aligarh 202002 UP

*** Associate Professor in Community Dentistry Collage of Dentistry Taibah University Madina Al Manawwarah Kingdom of Saudi Arabia

*E mail address for correspondence: msamiahmad@hotmail.com

Abstract: A major part of oral mucosa is lost during surgical removal of tumor, leukoplakia or other intraoral lesions. Application of buccal fat pad (BFP) in the replacement of lost mucosa is used now a day. This article demonstrates the use of BFP in the repair of oral mucosa lost due to leukoplakia. A case of leukoplakia lesion, 3 x 4 cm on the left side of cheek in a female age 42 years were successfully removed and reconstructed by BFP with the help of No 15blade under local anesthesia. Complete epithelialization of the BFP was observed after 5 – 6 weeks with no postoperative complication. Buccal fat pad is a reliable flap for the repair of lost oral mucosa. The easy mobilization of the BFP and its excellent blood supply makes it an ideal flap.

INTRODUCTION

Larger part of oral mucosa is lost during the surgical removal of tumor, leukoplakia or other intraoral lesions. Various surgical techniques have been suggested for the closure of oral defects such as primary closure, buccal mucosal graft, split thickness skin graft, allogenic graft, regional rotational flap and distant flap. The selection of reconstructive techniques depends on the size of the intraoral mucosal defect and the preference of the surgeon and may include skin graft, buccal fat pad flap and regional or free flap. The use of buccal fat pad as a grafting source in the closure of intra oral defects has gained popularity in the last quarter of this century. Because of ease of access and rich blood supply, its use in replacing buccal mucosa is common concept. In posterior defect of buccal mucosa, buccal fat pad flap is used because of low morbidity and failure rate. Buccal fat pad for oral reconstruction was first reported by Egyedi in 1977. (Egyedi P., 1977) In 1983, Nedor (Nedor A., 1983) reported the use of the buccal fat pad as a free graft for intra oral defects. Hao (Hao SP., 2000) used pedicled buccal fat pad flaps for reconstruction of medium sized post surgical oral defects mostly in malignant lesions. The buccal fat pad is an anatomically rounded and biconvex structure that is of great importance in the facial contour. Buccal fat pad for intraoral reconstruction was used by us with excellent results and it is described here in the case report.

CASE REPORT

A 42 years old female patient reported with complaints of burning sensation on left cheek for last 6 months and she noted white rough patch since last 5-6 months, which was increasing slowly. There was no complain of pain. Patient was neither tobacco chewer nor smoker. The oral hygiene of the patient was poor. She was not having any dental prosthesis; also there was no sharp tooth or overhanging filling in the vicinity of the lesion. Clinical examination revealed that left buccal mucosa of the cheek with white rough lesion of 3 x 4 cm, which involved the left buccal mucosa and the adjoining alveolar ridge and it was extending from distal side of mandibular left canine to left retromolar area. Clinically it was diagnosed a case of leukoplakia which was confirmed by histopathological examination.

It was planned to remove the lesion and reconstruction of lost oral mucosa with the buccal fat pad. The patient was placed on Amoxicillin capsules (500 mg 8 hrly) two days before the surgery. The periphery of the lesion was marked with the indelible marker. The lesion with 2mm healthy mucosa was planned to excise with the help of No.15 blade. The surgery was performed under local anesthesia using 2% lignocaine with adrenaline 1: 80,000 (Fig 2). The circumferential incision involving the periphery of the lesion was taken to the bone deep on the alveolar ridge and on the buccal mucosa buccinators fibers were cut and blunt dissection was done with adson forcep under the lesion. The whole lesion was removed using periosteal elevator bluntly dissecting it from the tissue bed. Now buccal fat pad was harvested by exposing the underline buccal mucosa and bluntly dissecting the area until yellow colour buccal fat pad was visible. Now non-toothed forcep was used to grasp the buccal fat pad. It was gently teased and pulled to the respective wound. Fibrous buccal fat pad is supplied by branch of facial artery. The buccal fat pad was sutured to the underlying wound using 3-0 black silk suture with round body needle. The patient was reviewed at regular one week intervals and sutures were removed 2 week after the surgery. After one week the healing was uneventful with out any necrosis or sloughing of the graft tissue. The pre operative interincisal opening was 36 mm, after the surgery and during the healing process inter incisal mouth opening was reduced slightly but after complete healing it came to normal as that was preoperative. No any post operative complication was observed.

DISCUSSION AND CONCLUSION

The buccal fat pad (BFP) is an encapsulated, rounded, biconvex specialized fatty tissue which is distinct from subcutaneous fat. It is located between the buccinators muscle medially, the anterior margin of the masseter muscle and the mandibular ramus and zygomatic arch laterally (*Samman N, Cheung LK, Tdeman H., 1993 and Liversedge RL, Wong K., 2002*). Buccal fat pad was considered a surgical nuisance for many years because of its accidental encounter during various operations in the pterygomandibular area such as tumor, orthognathic or trauma surgeries (*Samman N, Cheung LK, Tdeman H., 1993 and Rapidis AD, Alexandridis CA, Eleftheriadis E, Angelopoulos AP. 2000*). Egyedi (*Egyedi P., 1977*) in 1977 first reported the use of pedicle buccal fat pad for closure of post surgical maxillary defects. After that it has become a popular option among surgeons worldwide for the reconstruction of small to medium acquired or congenital soft tissue and bone defects in the oral cavity (*Samman N, Cheung LK, Tdeman H., 1993 and Martin-Granizo R, Naval L, Costas A, Goizueta C, Rodriguez F et al., 1997*).

Buccal fat pad has also been employed in the closure of surgical defects following tumor excision (*Baumann A, Ewers R., 2000*), excision of leukoplakia and submucous fibrosis (*Ho KH. and Yeh CJ., 1996*), as well as closure of primary and secondary palatal clefts (*Kim YK., 2001 and Hudson JW, Anderson JG, Russell RM Jr, Anderson N, Chambers K., 1995*). Buccal fat pad presents itself as an important component in the oral cavity and is of special clinical importance. The healing process of BFP as an uncovered fat pad is usual. In our case the transported BFP at lost mucosa (Fig 2) side swelled noticeably with a light yellow fibrous tissue covering its surface one week post operation (Fig 3) swelling faded with in 2-3 weeks. The defect areas shrank over time. Regenerated epithelia grew from the border to the center on the surface of uncovered BFP. BFP began epithelializing with in 2 – 4 weeks (Fig 5) and was completely epithelialized with in 5 - 6 weeks. Regenerated mucosa became smooth, pink, and developed an appearance similar to normal oral mucosa (Fig 6). This is an agreement with the established facts in the literature (*Samman N, Cheung LK, Tdeman H., 1993, Rapidis AD, Alexandridis CA, Eleftheriadis E, Angelopoulos AP., 2000 and Baumann A, Ewers R., 2000*). Tang et al (*Tang X, He D, Hua C., 2006*) in forty one cases achieved healing by 1st intention except one case because of large defect. Oedema faded and epithelialization occurred after 4 week of operation. Thirty five cases were followed up 3 months to 5 years. There were no obvious differences in layers, colour, elasticity and texture between repaired region and adjacent mucosa. Baumann and Ewers repaired lost oral

mucosa of 5.5 x 4 cm in size, all inserted fat grafts healed well without any esthetic disturbances. The advantages of BFP include ease harvesting, simplicity, versatility, and low rate of complication as well as quick surgical technique (Samman N, Cheung LK, Tdeman H., 1993, Rapidis AD, Alexandridis CA, Eleftheriadis E, Angelopoulos AP., 2000, Baumann A, Ewers R., 2000 and Stajcic Z., 1992). The fact that BFP is located in the same surgical field as the defects to be covered and the possibility of harvesting under local anesthesia are added advantages.

In conclusion, buccal fat pad is reliable for the replacement and reconstruction of lost oral mucosa due to leukoplakia lesion. The easy mobilization of the buccal fat pad and its excellent blood supply and minimal donor site morbidity makes it an ideal.



Fig 1: Preoperative photograph showing the extension of the leukoplakic lesion



Fig 2: Showing the excised lesion with buccal fat pad exposed

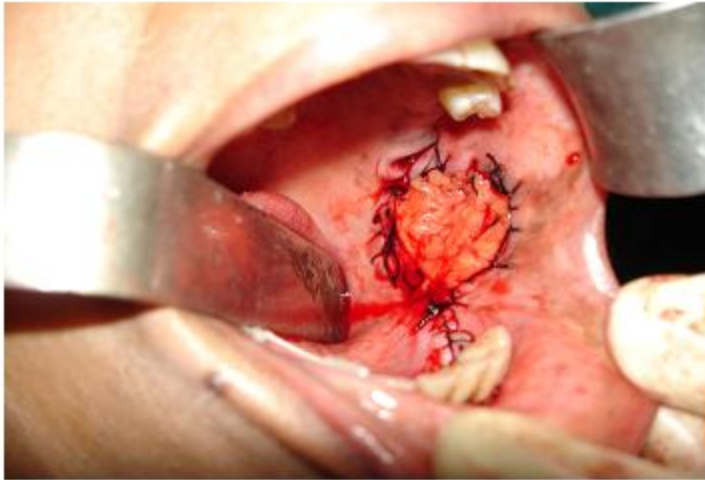


Fig 3: Buccal fat pad placed on the surgical wound created by excising the lesion and sutured circumferentially with healthy mucosal margin.



Fig 4: Lesion after one week



Fig 5: Lesion after 15 days



Fig 6: After complete healing and normal opening of the mouth

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SONOGRAPHIC PITFALLS ASSOCIATED WITH POST-HYSTERECTOMY

*Erondu Okechukwu Felix, *Okoro Chinedum Richards, **Ugwu Anthony Chukwuka
and ***Aniemeka Joy Ifeanyi

* Department of Clinical Imaging, Image Diagnostics Port Hacourt, Nigeria

**Department of Radiography and Radiological Sciences, Nnamdi Azikiwe University, Nnewi Campus,
Anambra State, Nigeria

*** Department of Radiology, University of Portharcourt Teaching Hospital

E-mail address for correspondence: tonybullng@yahoo.ca

Abstract: *Cases of sonographic pitfalls associated with post-hysterectomy are presented. Trans-cutaneous pelvic sonography was carried out on three patients who had hysterectomy, without our knowledge. Pelvic structures were evaluated, and showed pseudo-masses due to solid faecal matter within gas-filled distal bowels which mimicked solid heterogenous shadowing masses within an ill-defined uterus. The large vaginal cuff, following hysterectomy as well as a cervical fibroid equally resembled an ill-defined uterus. Finally, an ectopic gestation was easily overlooked on account of the history. Repeat scans with distended urinary bladder, and a knowledge of patients' surgical history as well as observed peristaltic movements revealed the observed appearances as false. Laboratory correlation with serial HCG and laparotomy confirmed a lower abdominal mass to be an ectopic pregnancy. The presence of pseudo-lesions mimicking uterus, cervical fibroids and ectopic pregnancies are possible post-hysterectomy pitfalls.*

INTRODUCTION

Hysterectomy is the surgical removal of the uterus and is the most commonly performed gynecological procedure. In 2003, over 600,000 hysterectomies were performed in the United States alone, of which over 90% were performed for benign conditions (Wu JM, Wechter ME, Geller ES et al., 2007)

Hysterectomy is usually performed for problems with the uterus itself or problems with the entire female reproductive complex. Some of the conditions treated by hysterectomy include uterine fibroids (myoma), endometriosis, adenomyosis, several forms of vaginal prolapse, heavy or abnormal menstrual bleeding and at least three forms of cancer (uterine, advanced cervical, ovarian). Hysterectomy is also a surgical last resort in uncontrollable post-partum obstetrical haemorrhage. (Roopnarinesingh R, Fay L, McKenna PA., 2003)

Sonographically, the uterus is seen as a homogenous structure, lying posterior to the distended urinary bladder. The central endometrial canal is represented as a hyperechoic line. Intracavitary scanning provides superior detail of the uterine tissue and better describes phases of the menstrual cycle (Goldstein SR., 1989)

Till date, internet literature search has not revealed any published data on false positive signs of the uterus in sonography following hysterectomy. We report three presentations mimicking solid heterogenous and .

predominantly shadowing masses within ill-defined uterus, ectopic gestation and cervical myomas after hysterectomy.

SUBJECTS AND METHODS

CASE 1

A 45year old female patient with recurrent pelvic pain which exacerbated during the mid-cycle was referred for ultrasound assessment. Initial clinical findings suggested a probable pelvic mass.

CASE 2

A 42 year old obese lady was referred for abdomino-pelvic scan due to persistent lower abdominal pain. Pain had lasted for over a week despite use of strong analgesics. Previous surgical history included appendectomy and total abdominal hysterectomy

CASE 3

A 34year old female was referred for ultrasound following complaints of suprapubic heaviness and episodes of menorrhagia, though menstrual periods have been rather infrequent. No history of previous gynecological surgery was documented by referring clinician. A close physical examination however showed a transverse supra-pubic scar.

INVESTIGATIONS

A digital ultrasound machine ACUSON 500 by Siemens Ag Germany was used for the investigations in these three cases.. The machine is equipped with multi-frequency sector, volume as well as endovaginal probes. The caliper calibrated for an assumed sound velocity of 1540ms^{-1} in soft tissue. Accelerating voltage equal to or less than 20KV with a mains input frequency of 50Hz. The investigations were performed with 5.0MHz endo-vaginal and 3.5 – 5.0MHz transcutaneous probes.

RESULTS

Case 1

Initial trans-cutaneous scan revealed appearances of a probable heterogenous, predominantly hyperechoic mass with minimal acoustic shadowing, lying posterior to the urinary bladder, with an apparently irregularly shaped ill-defined uterus. (Fig 1A). Small masses of similar echotexture were noticeable on the right. The vaginal cuff seen with endo-vaginal probe mimicked a small size uterus. (Fig 1B).

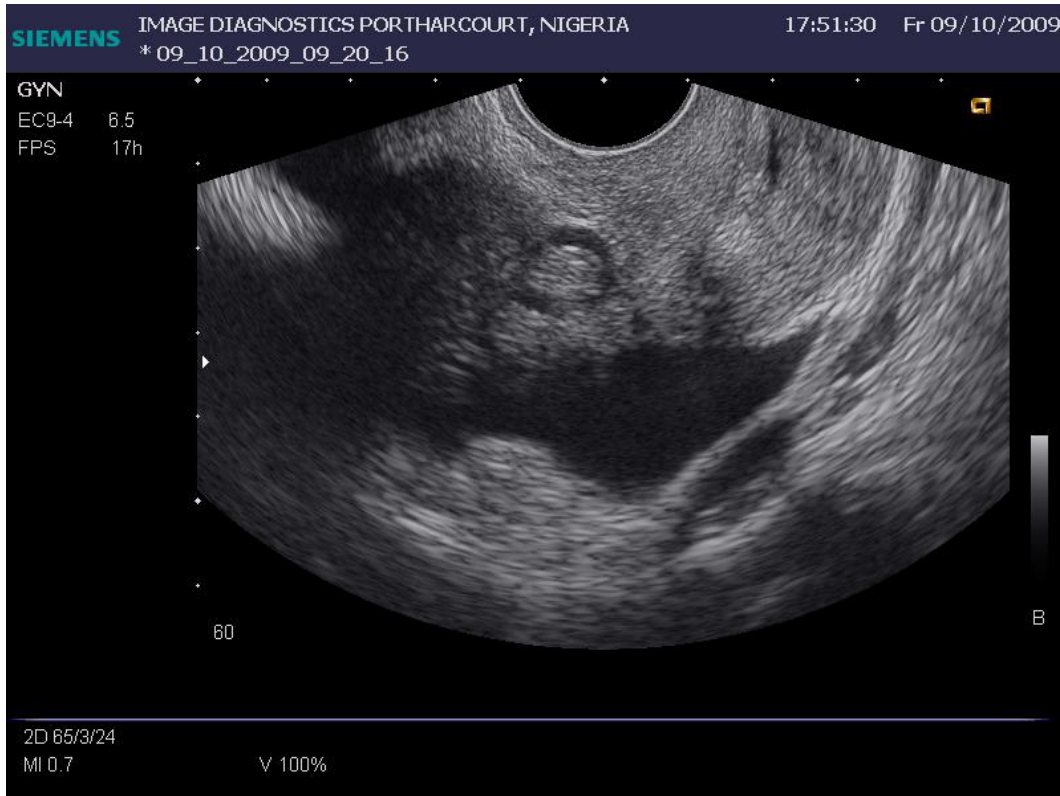


Fig 1A: Faecal and bowel shadows mimicking mass lesions in illdefined uterus

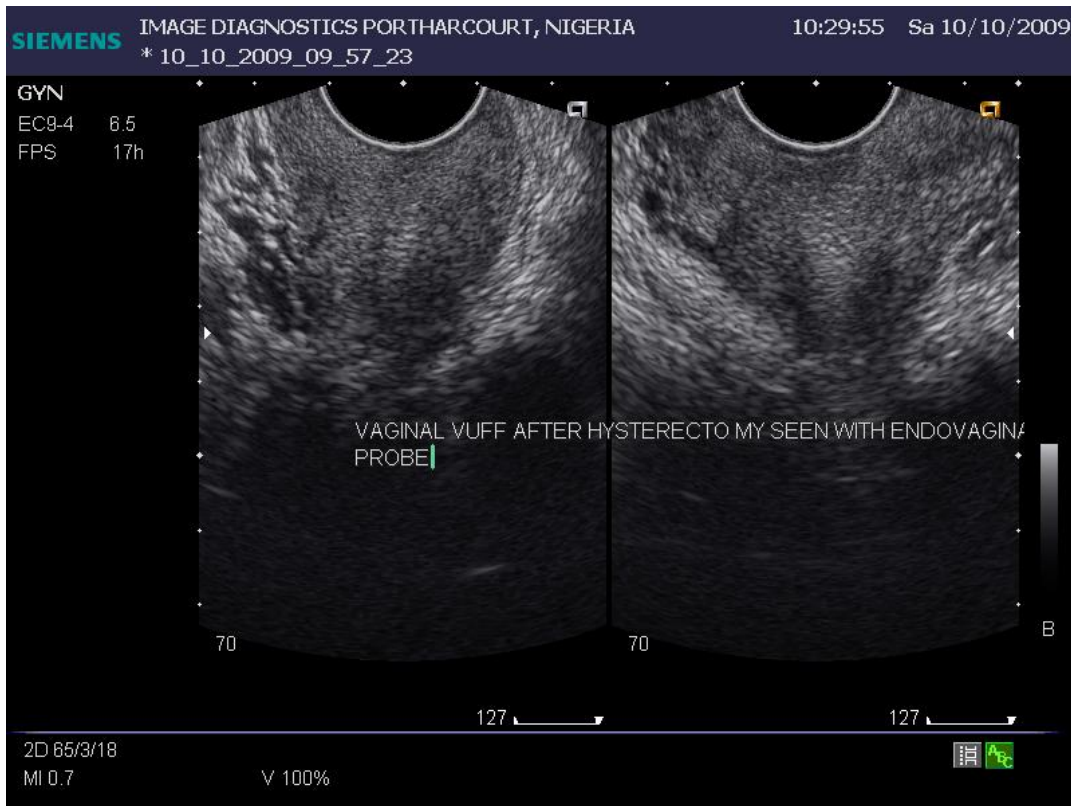


Fig1B: Endovaginal sonogram showing prominent vaginal cuff, giving a pseudo-uterine appearance

Doubts arose about the correct identification of the central structure, as the supposedly uterine borders were not clearly defined, and the normal configurations of the uterus especially in the longitudinal plane were obviously absent. Further enquiry from the patient revealed that she had a previous hysterectomy about 5 years earlier.

A repeat scan was performed an hour later with the bladder more adequately filled. Both trans-cutaneous and endo-vaginal approaches were used.

There was a change in the position and configuration of the supposed uterus as well as the mass. Furthermore, real time peristalsis was noted adjacent and surrounding the mass, confirming it's bowel origin. However, the left adnexal cystic mass persisted and was clearly shown to be a simple left ovarian cyst.

Pitfalls

- (a) The supposed ill-defined endometrial and uterine borders were actually the mucosal linings and walls respectively of the bowels.
- (b) The supposed solid hyperechoic mass was confirmed to be faecal matter within the bowels.
- (c) The sono-luscent region posterior to the mass was identified as the rectum mimicking the Pouch of Douglas
- (d) The large vaginal cuff was mistaken for mass .
- (e) Reverberation artifacts from gas-filled bowel mimicked shadowing from a calcified intrauterine mass

Case2

The pelvic structures are indistinguishable due to bowel gas shadowing. No ovarian cysts were seen on endovaginal sonogram. On trans-abdominal ultrasound, a poorly circumscribed heterochoic mass measuring about 2.8 x4.1cm was noted in the right lower abdomen. (Fig 2).

A small amount of fluid was seen in the dependent portion of the pelvic cavity.

A provisional diagnosis of haemorrhagic pelvic mass of unknown origin was made.

Serial quantitative HCG followed by laparotomy confirmed the mass to be a leaking tubal (ectopic) gestation.



Fig2A

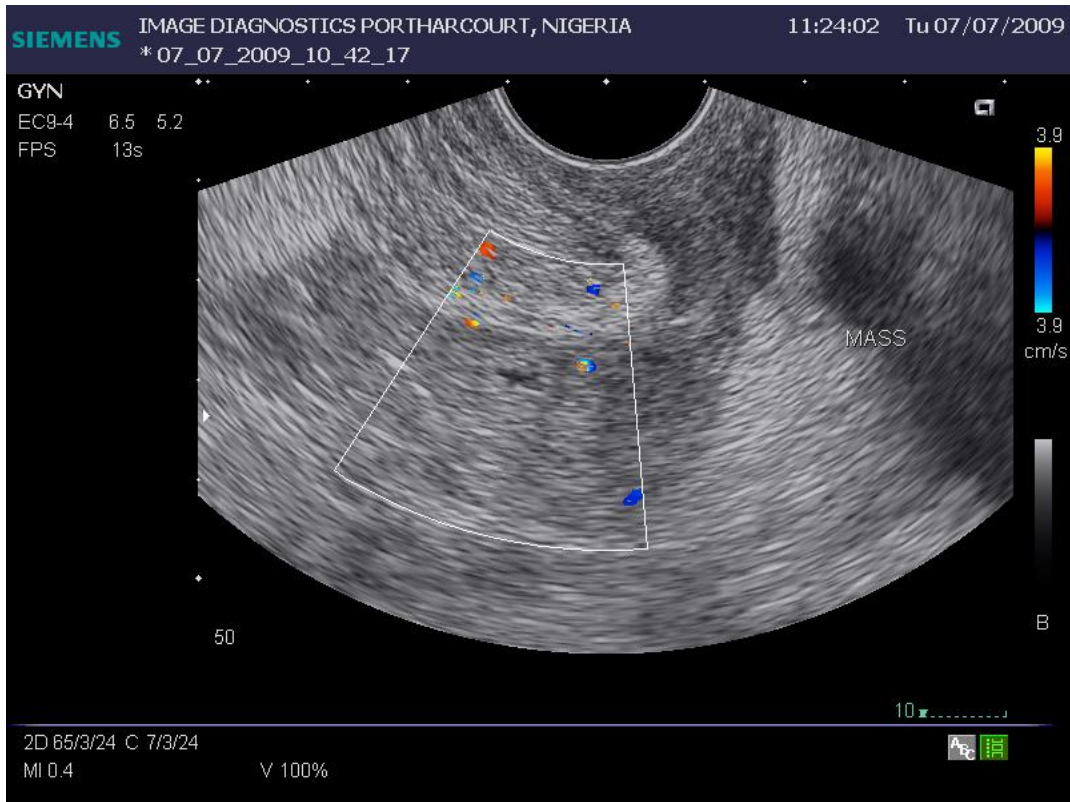


Fig2B

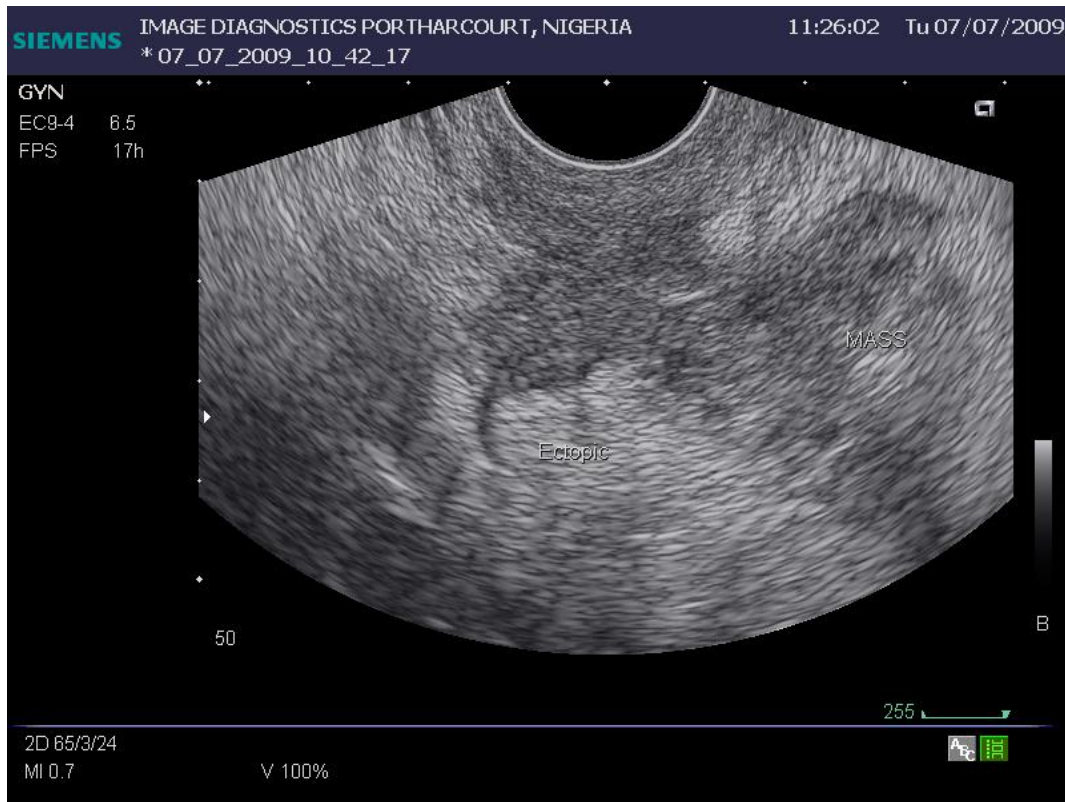


Fig2C

Case 3

Ultrasound (transvesical) with urine filled bladder showed a solid hypoechoic mass with size 1.8x2.2cm. Mass has poorly defined superior margins and seen to be arising from the pelvis. (Fig 3 A)

It was difficult to identify origin of this mass. Endovaginal sonogram was therefore performed. The supposed mass was seen to be a polypoid cervical fibroid. Uterine margins were not visualized. (Fig3B)

Detailed clinical history revealed the lady had a vaginal hysterectomy 2 years earlier. There was no history of uterine fibroids prior to the hysterectomy.



Fig3A

Pitfalls

1. Indistinguishable pelvic structures due to overlying bowel gas
2. A polypoid cervical fibroid mimicked a poorly defined uterus

DISCUSSION

Sonography plays a critical role in the work up of the female pelvis masses and often dictates further management. Classical sonographic features of the uterus are well-known in literature, but may be altered due to masses, disease or following partial hysterectomy.

Pitfalls have been highlighted in the assessment of other organs (Agwu KK, Okoye I.J, Erondy, OF., 1997 and Cheng G, Soboleski D, Daneman A, Poenam D, Hurlbut D., 2005) but none has been described in post-hysterectomy.

Sonographic pitfalls may generally follow the physical interaction of sound waves with body tissues and have been previously documented in literature. For instance, the loss of ultrasound distal to a strong reflector or attenuator resulted in an artifact called acoustic shadowing². While this could become a useful tool in diagnosis of gallstones, it may become deleterious and in fact impede the proper scanning of organs when caused by bowel gas.

Authors have reported artifacts due to acoustic enhancement (Taylor KJW.) or reverberation between the transducer face and any brightly reflecting interface (Stadmueller LA., 1983) or even slice thickness (Goldstein A, Madrazo B., 1981).

Improper scanning techniques as well as failure to identify anatomic variations may produce pseudo-lesions (*Bernadino ME, Sones PJ.*)

The importance of a properly done sonogram following hysterectomy cannot be overemphasized. The accuracy and specificity of any diagnosis depends on the sonographer differentiating normal anatomical variations from seemingly pathological changes. The ultrasound appearances of a normal uterus includes its low-level, homogenous echoes with a centrally placed, strong linear echo denoting the endometrial cavity. The typical uterus lies centrally within the pelvis, posterior to the bladder and cephalad to the vagina.

On trans-abdominal sonogram, this could be assessed on a longitudinal scan with the bladder adequately filled.

Furthermore, the Pouch of Douglas which sometimes contain a certain amount of fluid lies posterior to the uterus and anterior to the rectum.

The case reports demonstrated possible pitfalls that may arise following hysterectomy. We describe the cases with surgical correlation in which pitfalls were noted in sonography.

In the case 1, the large vaginal cuff following hysterectomy was initially thought to be a mass. The bowel loops which flap down, occupy the space originally taken by the uterus. Consequently, faecal load within the colon thus mimicked solid masses which produced acoustic shadows within a supposed uterus. The rough mucosal pattern and walls of a distal colon may produce a pseudo-uterine appearance.

Ectopic pregnancy as observed in case 2 is a rare but possible scenario and could present diagnostic dilemmas. Jackson et al (*Jackson P, Barrowclough, France JT, et al., 2005*), has earlier reported a case of successful pregnancy following total hysterectomy, and emphasized the importance of a properly performed sonogram in such instances. Misky T et al (*Misky T, Chatzipapas J, Hart R et al., 2001*) reported the possibility of pelvic collections, and in fact compared the incidence after, abdominal, vaginal and laparoscopic laparotomy.

The essence of reporting pitfalls, is mainly to educate practitioners, with a view to effectively preventing them during sonographic imaging. The authors found the following steps to be useful during a post-hysterectomy scan.

1. Properly ascertaining the patients past medical history
2. Ensure the urinary bladder is adequately filled as this helps to displace the distal colon away from the pelvis and improves acoustic window during transabdominal sonogram. In addition it provides a good anatomic guide if endo-vaginal probe is used.
3. Look out for peristalsis, and be sure the supposed mass has no bowel origin
4. Combined use of both trans-abdominal and endo-vaginal probes, will ensure that masses and atypical ectopic gestations are identified.
5. A water enema can be given and the scan repeated
6. An unusual configuration of the uterus, with fundus merging imperceptibly with the bowels should be looked for.
7. The use of graded compression with real time scanning allows evaluation of both bowel wall movement as well as thickness. (*Goldstein A, Madrazo B., 1981*)

CONCLUSION

It is therefore clear that pitfalls may arise during post-hysterectomy scan. It is important to carefully evaluate the pelvis in such case. A good knowledge of patients history and application of certain technical manouvres are suggested to overcome potential pitfalls associated with post-hysterectomy..

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