

MIDSHAFT CLAVICLE FRACTURES

FEBRUARY/MARCH 2009

by Dr David Duckworth

The midshaft clavicle fracture has been one of the most neglected fractures of the upper limb over the last 30 years. For years, in the majority of cases, patients were treated conservatively and told that they would be left with a lump over the clavicle and their shoulder function would slowly return to normal.

This is not the case and over the last ten years there has been a gradual move to surgical fixation of clavicle fractures as the long term results of conservatively managed fractures have been less favourable than might have been expected¹. Non-union and malunion is higher in conservatively treated fractures and it has been shown that there is an unacceptable incidence of pain and shoulder dysfunction with malunited fractures². It has therefore gradually become standard orthopaedic practice to fix the majority of displaced midshaft clavicle fractures.

PRESENTATION

The majority of these fractures are related to sporting injuries such as rugby, bike riding or skiing. The fracture usually results from a direct blow onto the clavicle or a fall onto the shoulder. Most patients hear or feel a crack when the clavicle fractures. They then notice specific pain over the clavicle and often feel a lump under the skin. The shoulder tends to sit forward and the patient can often feel the two ends of bone moving apart. The shoulder is very painful for the first week when any form of movement occurs in the arm. The shoulder is best rested in a sling until appropriate medical treatment can be sought and the diagnosis made.

ADVANCES IN MANAGEMENT

In my practice most fractures of the clavicle that are displaced, angulated or overlapped are best treated with an operation. (Figure 1) This



FIGURE 1
Radiograph of displaced clavicle fracture

operation can either be performed by realigning the bones in their original shape using a "plate and screws" on top of the bone or by using a "pin" that goes down the centre of the bone. The idea of the operation is to make the patient as comfortable as possible by making the fracture stable, and therefore allowing them to return to normal activities as soon as possible.

New techniques and new implants used for fixation have developed over the last 10 years

making this operation a lot easier. Originally the clavicle plates used were quite bulky and the scar over the clavicle unsightly. Plates have now evolved into being much smaller, low profile and



FIGURE 2
Clavicle post fixation

anatomical making reduction of the fracture much easier and creating less irritation of the plate on the bone. (Figure 2)

With these new implants have also come new methods for plating and we have recently designed a new technique called the "Limited Incision Plating" (LIP) technique.

With this new LIP technique, the incision is made below the clavicle removing the problem of



FIGURE 3
Postoperative scar using LIP technique

irritation from the scar sitting over the plate. Due to the smaller plate size and more anatomical shape of the plate, the incision is also much smaller making it cosmetically more attractive. (Figure 3) With this method it is now possible to plate a clavicle through only a 3 or 4cm incision (an incision half the size of the plate you are inserting). The smaller incision also means less soft tissue dissection reducing the complication rates and decreasing the incidence of infection and non union.

Patients have found this method extremely successful and minimally invasive. We have also found that complications following this surgery are much less than those previously reported. The incidence of non-union and infection has been less than 1%. The biggest problem I have found with this technique is trying to prevent the patient from doing too much too early as their shoulder generally feels relatively normal very quickly after fixation.

WHICH CLAVICLES ARE NOW PLATED?

In my practice any adult patient with a displaced or shortened clavicle is offered an operation to stabilise the clavicle.

In adolescents with clavicles that are overlapped and shortened they are also offered surgery. We have also started to plate the angulated fractures in adolescents who want to return to contact sport due to the high incidence of refracture if left alone.

Children less than 12 years still rarely require surgery due to their remodelling potential and can simply be rested in a sling.

POSTOPERATIVE MANAGEMENT

Patients after surgery feel immediate relief of pain and feel their shoulder is back in its normal position again. A sling is really only worn for about a week and patients are told to gradually use their arms as comfort allows. Fractures in adolescents generally take 4 weeks to heal and adults about 6 to 8 weeks to heal depending on the degree of comminution. Sport is resumed once the fracture has healed. The plate, due to its low profile, is now generally kept in situ rather than being removed as it causes minimal if any irritation.

SUMMARY

Displaced midshaft clavicle fractures are now generally treated aggressively by open reduction and internal fixation. The implants used and techniques have also improved such that the clavicle can generally be plated through a minimally invasive incision of 3 to 5cm below the clavicle. Return to activity is then often possible between 6 to 8 weeks and the shoulder in the majority of cases does return to normal function.

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ADVANCES IN CORONARY STENTING

by Dr Anil Aggarwala

Coronary angioplasty and stenting has been in existence for about 30 years. Constant technique refinements have resulted in major advances and the indications for coronary angioplasty and stenting have also expanded.

HISTORICAL PERSPECTIVE

Coronary angioplasty was first started in 1977 by Dr Andreas Gruentzig and involves dilation of coronary artery lesions using balloons. ¹ Early on, the technique was obviously daunting and the incidence of complications and re-stenosis was high. Techniques of rotational and directional atherectomy together with laser angioplasty were potential treatment options early on although coronary stenting has become the mainstay of treatment. Coronary stenting was described in 1987 and the technique was used for scaffolding coronary arteries that were threatening to close off at the time of angiography and certainly made life much easier for interventional cardiologists. ² However, in-stent stenosis was still a significant problem although the incidence of re-stenosis was less than with balloon angioplasty alone. The introduction of drug eluting stents in 2001 decreased the incidence of re-stenosis even further. Drug eluting stents were first introduced in 2001 and involved the delivery of anti-proliferative drugs locally to the surface of the artery. The drug is coated onto the stent surface via polymers. Slow elution of the drug resulted in decreased re-stenosis by inhibiting neointimal proliferation within the vessel. Stents designs and anti-platelet therapy regimes have improved over the years resulting in an explosion of stent usage worldwide. 70-90% of all angioplasty procedures now involve insertion of one or more coronary stents.

STENT THROMBOSIS

Despite drug eluting stents being effective with reducing re-stenosis and the need for further revascularisation, the problem remains and this can occur several years after stent implantation. Discontinuation of anti-platelet agents is one of the important causes of stent thrombosis and other factors include malapposition of stent struts with the vessel wall, hypersensitivity reactions, abnormal re-endothelialisation and resistance to Aspirin or Clopidogrel. It is therefore critical that patients stay on dual anti-platelet therapy (Aspirin and Clopidogrel) for at least one year and then Aspirin alone indefinitely. An argument could be made for some of these patients staying on Clopidogrel indefinitely. Patients with drug eluting stents requiring surgery should continue Aspirin peri-operatively unless absolutely contraindicated.

ACUTE MYOCARDIAL INFARCTION

It is now well documented that acute reperfusion with angioplasty and stenting in patients presenting with acute myocardial infarction improves survival and the risk of re-occlusion and re-infarction. ³ Coronary angioplasty and stenting is therefore the preferred management option if the time duration from patient arrival to balloon time can be achieved within about 90 minutes or if fibrinolysis is contraindicated. Fibrinolysis is still the preferred management option when patients do not have rapid access to hospitals with acute intervention facilities.

THE FUTURE

It is estimated that there are more than 2 million coronary percutaneous procedures worldwide every year and about 1 million procedures within the United States. The introduction of drug eluting stents has decreased the incidence of in-stent re-stenosis but has resulted in a slight increase of very late stent thrombosis. Recommendations regarding anti-platelet therapy have been revised as a result. The next generation drug eluting stents which will potentially have biodegradable polymers and this together with ongoing refinement of pharmacological therapy will increase the scope of stenting use.

Patients with triple vessel disease have historically been best managed with bypass grafting and have now become potential candidates for management with coronary angioplasty and stenting.

Intravascular ultrasound has been around for several years now and this imaging modality is useful for assessing atherosclerotic plaque burden and is also useful in assessing vessel size. Spatial analysis of the ultrasound signal does provide further details of the composition of the plaque. The use of intravascular ultrasound is clearly going to increase over the years. Another imaging modality which is being used in some centres involves Optical Coherence Tomography (OCT). This is used to assess culprit lesion morphology. The incidence of plaque rupture by OCT is significantly higher than with intravascular ultrasound. ⁴

Stent designs are improving and biodegradable stents are being trialed. Stents with multiple holes along the stent struts which act as reservoirs which can have different drugs embedded within them are also being trialed and these stent designs are likely to impact in the future.

CONCLUSIONS

Coronary angioplasty has been around for about 30 years and has been largely taken over by coronary stenting with ongoing improvements and refinements. The scope of patients being treated with coronary stenting is also increasing and some of the newer stents being trialed look promising as are the imaging modalities.

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ENDOSCOPIC ULTRASOUND: DIAGNOSTIC AND THERAPEUTIC APPLICATIONS

by D. Brian Jones

INTRODUCTION

Endoscopic Ultrasound (EUS) is a relatively new endoscopic imaging modality for visualising disease processes on and within the wall of the GI tract, and in adjacent organs. The Sydney Adventist Hospital has recently acquired a EUS system which will have potential impact on the management of a number of benign and malignant diseases of the upper GI tract. EUS should be regarded as complimentary to other imaging modalities such as conventional ultrasound, CT scan, MRI and PET scan.

INSTRUMENTATION

There are two basic types of echoendoscopes: those with radial scanners and those with linear scanners (Figure 1). Radial scanners provide 270–360° viewing perpendicular to the direction of insertion. The oesophageal, gastric and duodenal



FIGURE 1
Olympus Radial (left) and Linear (right) Echoendoscopes

wall (Figure 2), as well as the pancreatic and extrahepatic biliary tract, can be visualised. Linear scanners are used for EUS-guided FNA (fine needle aspiration biopsy).

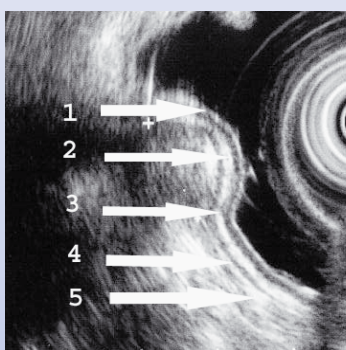


FIGURE 2
Gastric wall layers. 1: mucosal interface, 2: muscularis mucosae, 3: submucosa, 4: muscularis propria, and 5: serosa

Applications of Endoscopic Ultrasound EUS are now well established in:

- Staging of Oesophageal Cancer
- Staging of Gastric Cancer including MALT lymphoma
- Staging of Pancreatic Cancer

- Assessment of subepithelial lesions of the upper GI tract such as leiomyoma and gastrointestinal stromal tumour (GIST)

- Assessment of pancreatic cystic lesions

- Assessment of mediastinal lymphadenopathy such as in tuberculosis, cancer or sarcoidosis

- Assessment of the biliary system, such as for the diagnosis of common bile duct stones

EUS IN OESOPHAGEAL CARCINOMA

The staging of oesophageal cancer is crucial to guiding further therapy, including determination of unresectable or incurable disease, determining potential candidates for endoscopic therapy and determining candidates for neo-adjuvant chemotherapy. EUS is useful in determining depth of tumour invasion (T stage – Figure 3) and nodal involvement (N stage) but is not useful for distant metastases where CT and PET scans are better.

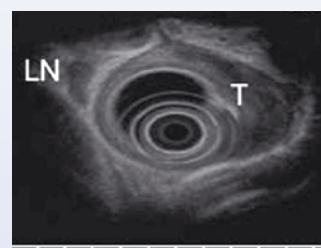


FIGURE 3
EUS of T3, N1 oesophageal cancer. T = tumour; N = lymph node

EUS IN GASTRIC MALIGNANCY

1. Gastric adenocarcinoma

EUS has also added greatly to the staging of gastric cancers, although limited in use in advanced cancer. With the advent of mucosal resection for early gastric cancers, appropriate staging of a gastric cancer limited to the mucosa or invading the muscularis mucosa is very important.

2. MALT lymphoma

Gastric MALT is associated with H. pylori infection which can be demonstrated on biopsy in about 90% of cases. EUS has become the imaging modality of choice in gastric MALT. Where the MALT infiltration is confined to superficial gastric layers (mucosa and submucosa) without lymphadenopathy on EUS, anti H. pylori therapy will result in resolution of MALT in up to 75% of patients. In contrast, when EUS staged the MALT at a more advanced level, these patients should be offered oncological review and treatment according to standard lymphoma protocols.

3. Gastrointestinal Stromal Tumour (GIST)

The incidental subepithelial mass is not an

uncommon finding at upper GI endoscopy and endoscopic biopsies are usually unrewarding in yielding a diagnosis. EUS is able to demonstrate whether the lesion is mural or extramural, as well as defining the wall layer of origin. GISTs and leiomyomas are demonstrated on radial EUS as hypoechoic mass lesions arising usually from one of the two muscle layers (Figure 4). EUS criteria will assist in decision making regarding need for surgical resection.

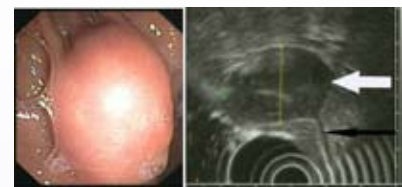


FIGURE 4
Endoscopic (left) and EUS (right) views of gastric GIST. Note hypoechoic well circumscribed lesion (white arrow) as a continuation of muscularis propria (black arrow)

EUS IN PANCREATIC LESIONS

EUS has become well established in the diagnostic work up of patients with possible or probable pancreatic malignancy in one of two settings:

- Assessment of pancreatic cystic lesions.

- Staging of probable pancreatic adenocarcinoma in terms of suitability for resection.

PANCREATIC CYSTIC LESIONS

The critical management issue is to decide whether a pancreatic cystic lesion is benign, potentially malignant or frankly malignant. Among neoplastic cystic lesions of the pancreas, the most common lesions are serous cystadenomas, mucinous cystic neoplasms, intraductal mucinous neoplasms (IPMN) and more rarely cystic islet cell tumours. EUS has superior resolution to CT and is able to define microcystic morphology (Figure 5). EUS-FNA may aid in further defining the exact diagnosis particularly with respect to malignant

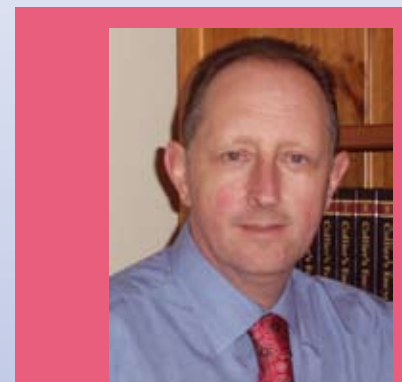


FIGURE 5
EUS of pancreatic cyst. Note solid papillary projection (arrowed).

or premalignant potential. Cyst fluid analysis may include stains for mucus, cytology, and estimation of amylase and a number of potential tumour markers, particularly the cyst CEA concentration.

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FIGURE 6
EUS of a clump of mediastinal lymph nodes (arrowed) due to sarcoidosis. AO: aorta; LA: left atrium

pancreatic adenocarcinoma. Complete surgical resection requires absence of distant lymph node involvement, liver or other metastases, or major vascular involvement such as superior mesenteric artery or portal vein. At the time of surgery only between 5% and 25% are resectable. The role of imaging therefore is to select carefully those who may benefit from surgical exploration. In addition pancreatic neoplasms can be subjected to fine needle aspiration biopsy during EUS to confirm diagnosis. Diagnosis of surgical unresectability is mostly based on EUS demonstrating portal vein invasion or positive EUS-

PANCREATIC ADENOCARCINOMA

Pancreatic cancer is one of the most lethal cancers and surgery offers the only chance of cure. Complete surgical resection requires absence of distant lymph node involvement, liver or other metastases, or major vascular involvement such as superior mesenteric artery or portal vein. At the time of surgery only between 5% and 25% are resectable. The role of imaging therefore is to select carefully those who may benefit from surgical exploration. In addition pancreatic neoplasms can be subjected to fine needle aspiration biopsy during EUS to confirm diagnosis. Diagnosis of surgical unresectability is mostly based on EUS demonstrating portal vein invasion or positive EUS-

FNA aspirates of enlarged coeliac lymph nodes.

EUS IN MEDIASTINAL LYMPHADENOPATHY

Studies have confirmed the safety and accuracy of trans oesophageal EUS for sampling mediastinal lymph nodes (Figure 6). It is superior to trans bronchial biopsy and less invasive than mediastinoscopy. EUS guided FNA may be diagnostic for lymphoma, tuberculosis, carcinoma and sarcoidosis.

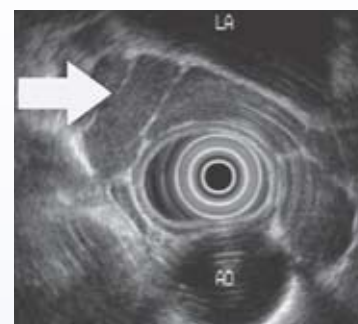


FIGURE 7
EUS of distal common bile duct with calculus (arrowed)

EUS IN CHOLEDOCHOLITHIASIS

EUS provides excellent views of the gall bladder and biliary system. It is superior to MRI cholangiography for suspected common bile duct

stones (Figure 7) and unlike ERCP does not have potential serious side effects such as post procedure pancreatitis.

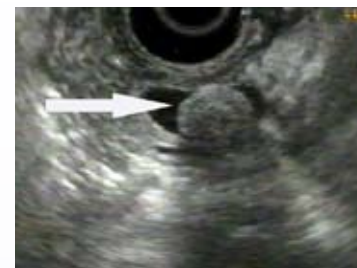


FIGURE 8
EUS of distal common bile duct with calculus (arrowed)

ACCOMMODATION SERVICES AT THE SAN

Jacaranda Lodge is an on-site low cost accommodation service open to both Sydney Adventist Hospital and other Hospitals' patients and their families. While it does not provide medical or nursing care, the Lodge offers twin or triple bedrooms with en-suites, kitchen and cooking facilities, access to the hospital tennis court, swimming and café facilities for family members of San inpatients, San patients having radiotherapy treatment and also patients having treatment at other hospitals.

For bookings call 9487 9066.

NEWLY ACCREDITED DOCTORS

The SAH Board of Directors has recently approved the following doctors as Accredited Medical Officers:

Dr Greg Carruthers - Anaesthesia

Dr Chandri Perera - Rheumatology

Dr Jeffrey Nutt - Nephrology

Dr Peter Wood - Obstetrics & Gynaecology

Dr Chumki Majumder - Surgical Assistant

Dr Thomas Solano - Infectious Diseases

Dr David Robinson - Vascular Surgery

Dr Walid Mohabbat - Vascular Surgery

News from the San

HOSPITAL IN THE HOME PATIENTS COVERED BY HCF

All Health funds now cover patient transfer into Hospital In The Home. Ring HITH Director Dr Suhan Baskar for more information on 9487 9481

NEW ENDOSCOPIC IMAGING MODALITY

Sydney Adventist Hospital has acquired an Endoscopic Ultrasound System (EUS) used to evaluate and grade tumours of the oesophagus, stomach, pancreas, lungs and rectum.

REFRESHER COURSES FOR REGISTERED NURSES RETURNING TO WORK.

The San College of Education (SANCE) is running four 6 week programs for Registered Nurses and midwives who are interested in or returning to acute care nursing. 10 classroom days cover a variety of topics, and over 9 clinical days refresher students are buddied with nurses throughout all clinical areas. Nurses who are interested in returning to maternity, complete clinical days in the maternity unit and rejoin the general group for classroom days. Queries Kay Leatherland Nurse Educator 9487 9039 kaylene.leatherland@sah.org.au

ADDITIONAL STAFF AT SAH

SAH now has 8 registrars following the addition of 5 to the team in January. There is also an additional New Acute Care Career Medical Officer on day shift who will look after a limited number of the sicker / higher dependency ward patients.

SUCCESSFUL SUPPORT FOR MENS HEALTH

The 'Movember' campaign initiated and supported by 24 SAH Drs, operating theatre, nursing and other staff - nicknamed 'SANBROS' - raised over \$10,000 towards prostate cancer and male depression. Further donations can be made to www.movember.com for the 'SANBROS' team.

NEW SAN PATHOLOGY COLLECTION CENTRE AT PENNANT HILLS

San Pathology is opening a new collection centre at 1/2 Hillcrest Road Pennant Hills. The expected opening date is late March. Queries San Pathology 9487 9500.

MARCH 2009

1	Sunday	Clean up Australia Day
2	Monday	
3	Tuesday	
4	Wednesday	
5	Thursday	
6	Friday	
7	Saturday	
8	Sunday	International Women's Day
9	Monday	National Orthoptic Awareness Week
10	Tuesday	
11	Wednesday	
12	Thursday	Worlds Greatest Shave
13	Friday	Coeliac Awareness Week
14	Saturday	
15	Sunday	NSW Seniors Week
16	Monday	
17	Tuesday	
18	Wednesday	
19	Thursday	NSW Corporate Games
20	Friday	
21	Saturday	World Downs Syndrome Day
22	Sunday	
23	Monday	National Musculoskeletal Therapy Week
24	Tuesday	World Tuberculosis Day
25	Wednesday	
26	Thursday	
27	Friday	Bandaged Bear Day
28	Saturday	National Youth Week
29	Sunday	
30	Monday	
31	Tuesday	

SAH GP 2009 CONFERENCES AND PUBLIC FORUMS

Sydney Adventist Hospital will again be holding free RACGP accredited conferences this year. Possible topics will include:

Emergency Care, Cardiac, Urology, Diagnostics, Gastroenterology / General Medical, Ophthalmology

Free public forums on men and womens health will also be held.

Dates to be advised.

www.sah.org.au