A magnet built on bronchoscopic suction for extraction of tracheobronchial headscarf pins: a novel technique and review of a tertiary centre experience

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Abstract

OBJECTIVES: Airway metal pins are one of the most commonly inhaled foreign bodies in Eastern societies in young females wearing headscarves. We innovated a modified bronchoscopic technique to extract tracheobronchial headscarf pins by the insertion of a magnet to allow an easy and non-traumatic extraction of the pins. The aim of this study was to assess the feasibility and safety of our new technique and compare it with our large previous experience with the classic bronchoscopic method of extraction of tracheobronchial headscarf pins.

METHODS: We performed a study comparing our retrospective experience of classic bronchoscopic extraction from February 2004 to January 2014 and prospective experience with our modified technique using the magnet from January 2014 to June 2015. An institutional review board and new device approval were obtained.

RESULTS: Three hundred and twenty-six procedures on 315 patients were performed during our initial 10-year experience. Of them, 304 patients were females. The median age of our group was 13 (0–62). The median time from inhalation to procedure was 1 day (0–1022). After introducing our modified new technique using the magnet, 20 procedures were performed. Nineteen were females. The median time of the procedure and the need to forcefully bend the pin for extraction were in favour of the new technique in comparison with our classic approach (2 vs 6 min; \( P < 0.001 \)) (2 patients = 20% vs 192 = 58%; \( P < 0.001 \)). The conversion rate to surgery was also in favour of the modified technique but did not reach statistical significance (0 = 0% vs 15 = 4.8%; \( P = 0.32 \)). All patients who underwent the modified technique were discharged home on the same day of the procedure. No procedural complications were recorded. All remain well on a follow-up period of up to 14 months.

CONCLUSIONS: Bronchoscopic extraction of tracheobronchial inhaled headscarf pins using a novel technique using homemade magnets was safer and simpler in comparison with our large experience with the classic bronchoscopic method of extraction of tracheobronchial headscarf pins.

Keywords: Magnets • Airway pins

INTRODUCTION

Airway metal pins are one of the most commonly inhaled foreign bodies in Eastern societies in young females wearing headscarves. The mechanism of inhalation is usually due to females inappropriately placing the pin in-between their lips while preparing to secure their headscarf and accidentally inhaling it on coughing, sneezing or laughing [1]. Treatment is almost always via a rigid bronchoscopic extraction. An endoscopic crocodile is used for extraction, occasionally by bending the pin into the bronchoscopic lumen if it is transversely impacted in the airway. This carries the risk of dislodgement of pin’s head and distal airway migration. In few cases, the metallic pin travels beyond the tertiary airway level and a mini-thoracotomy or video-assisted thoracoscopic surgery (VATS) is necessary for extraction.

We innovated a modified bronchoscopic technique to extract tracheobronchial headscarf pins by inserting a magnet to allow an easy and non-traumatic extraction of the pins. The aim of this study was to assess the feasibility and safety of our new technique.
and compare it with our large previous experience with the classic bronchoscopic method of extraction of tracheobronchial headscarf pins including patients in whom surgical extraction was needed due to distal migration of pins.

MATERIALS AND METHODS

We reviewed our 10-year experience from February 2004 till January 2014 for all cases of classic bronchoscopic and surgical headscarf pin extraction for patients who accidently inhaled the pin. Patients were diagnosed via a history given by the patient or the child’s parent for pin inhalation. An antero-posterior (Fig. 1) and lateral view chest X-ray confirmed pin position and were performed at a maximum of 2 h prior to the procedure to minimize the chances of undetected migration.

General anaesthesia was given for all procedures. Anaesthetic medications used included atropine, midazolam, propofol, succinylcholine and Atracurium besilate and all were administered according to the patient’s age and weight. The appropriate bronchoscopic size was determined and inserted according to the patient’s age and weight. An endoscopic crocodile suction was used for pin extraction. After the procedure, the patient was admitted to a high dependency unit for observation until discharge from the hospital.

If pin penetration had occurred and bronchoscopic extraction was deemed not possible, we woke the patient up and performed the surgical procedure on an elective basis after appropriate consent and patient/parent counselling.

We chose to operate via a modified surgical technique starting from January 2014. We reviewed our experience in a prospective manner starting from January 2014 until June 2015. The new technique used a new homemade surgical device (Fig. 2). On the tip of the rigid bronchoscopic suction, we built in two small magnets on top of each other (3 mm in diameter each) connected to the suction by a rubber bridge. The length of the homemade modified suction is 40 cm and its diameter is 4 mm which would allow an insertion of 4.5 mm and larger rigid bronchoscope (Karl Storz, Tuttingen, Germany). Manual cleaning and disinfection of the device was via the same protocol used for our rigid bronchoscopy.

The device was created in cooperation with a medical engineer and was approved for use and safety according to our university’s protocol. The same anaesthetic and bronchoscopic principles were used for all patients in whom the new device was used.

Inclusion criteria for the new technique included all patients aged 3 years and older with a confirmed inhaled tracheobronchial pin (by radiological diagnosis) with no overt distal migration of the pins into the lung parenchyma. Exclusion criteria included patients less than 3 years of age due to the difficulty of creating an insertion of 4.5 mm and larger rigid bronchoscope (Karl Storz).

Outcome variables between our classic approach and the new technique included length of the procedure, need for conversion to a surgical procedure and the need to bend the pin during extraction.

Follow-up included recording the immediate post-procedure course until the discharge of patient and a telephone call 4 weeks after the procedure.

The study was conducted in the largest national tertiary centre with highest patient volume of referral. Four thoracic surgeons were involved in the study.

All patients/parents consented to the new technique procedure. A new device application has been filed and permitted from the department of innovations in surgical techniques from Ain Shams University (ASU-DOIST-13-89). An institutional research board approval was obtained.

Collected data were then analysed and processed using SPSS version 20 (IBM, USA). General descriptive statistics, Mann-Whitney and Fisher’s exact test were performed on our data. Statistical significance was considered if P-value was less than 0.05.

Figure 1: Chest X-ray revealing a transversely impacted pin in a 3 and half year old child.

Figure 2: Bronchoscopic suction device with a homemade built-on double magnet attached to its tip.
RESULTS

During the initial study period in the first 10 years, we performed 326 bronchoscopic procedures on 315 patients. There were 304 females and 11 males. All males were below the age of 6 and inhalation was due to the presence of headscarf pin(s) in the parent’s house which was accidently picked up by the child. The median age of our group was 13 years (0–62).

The median time from inhalation to procedure was 1 day (0–1022 days). The median time of all the bronchoscopic procedures was 6 min (1–192). There was no mortalitity in our series and 3 patients (1%) were complicated by a pneumothorax and were treated conservatively with a chest drain.

Out of all procedures, 289 patients had the pin extracted successfully on the first attempt; 6 patients (12 procedures) needed a second attempt for pin extraction; 5 patients (10 procedures) needed a second attempt with the aid of a fluoroscopic device; 15 patients (4.8%) had distal migration of the pin with penetration of the lung parenchyma with the failure of bronchoscopic extraction and needed a surgical procedure for pin removal.

Out of the 15 surgical cases, 3 were performed via a VATS approach, 11 via a postero-lateral mini-thoracotomy and one required a full postero-lateral thoracotomy.

Out of the 326 cases, 192 cases (58.8%) needed bending of the pin for extraction (Fig. 3). Eight cases (4.1%) out of the 192 cases were complicated by dislodgement of the pin’s head on extraction. In 4 out of the 8 cases, the pin’s head was extracted using the bronchoscopic suction into the distal airway and in the rest of the 4 cases (all adults above 18 years with wider airway diameters) the pin’s head migrated distally into a sub-lobar segment and extraction was not possible. All 4 patients were followed up for a median period of 3 years (1–5 years) with no complications.

During the period of using our new technique, we were referred 34 patients. Twenty-six patients were eligible for the new technique, out of which 20 agreed to consent for the procedure. There were 19 females and 1 male child. The median age of patients was 12 years (4–31). The median time from inhalation to procedure was 1 day (0–19). There were no statistically significant differences between both groups regarding preprocedure characteristics.

The median time of the procedure was 2 min (1–14). This was significantly shorter than the classic procedure time (2 vs 6 min; P < 0.001). In 12 patients, the pin was longitudinally placed in the trachea or main bronchi and instantly extracted. In 6 patients, it was transversely placed and was extracted with no need of bending by attraction to the magnet. In 2 patients, the pin could not be initially visualized and the magnet was inserted till the most distal point of the airway. The tip of the pin became visualized as it was attracted into a more proximal position and the bronchoscopic crocodile was subsequently used to extract the pin via bending it into the bronchoscope.

The use of the endoscopic crocodile as an adjunct for extraction was needed in 2/20 (10%) of cases after attraction of a distal pin into a more proximal airway location and pin bending was used in both cases. This was superior in favour of our modified technique (192 patients = 58.8% vs 2 patients = 10%; P < 0.001).

There was no need for conversion to a surgical procedure in any case of our series. This was superior in our modified technique but did not reach statistical significance (15 patients = 4.8% vs 0 patients = 0%; P = 0.32).

Recovery in all 20 cases using our modified technique was uncomplicated, and they were discharged home on the same day. All patients remain asymptomatic on a follow-up period of up to 14 months. There were no pre-procedural statistically significant differences between both techniques regarding outcome (morbidity and mortality).

In general, the new modified technique was easy, reproducible, safe and required a short operative time. A comparison between both procedures in presented in Table 1.

![Figure 3: Extracted headscarf pin after forcefully bending it through the rigid bronchoscope.](https://academic.oup.com/icvts/article-abstract/22/5/531/2639587/https://academic.oup.com/icvts/article-abstract/22/5/531/2639587)

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DISCUSSION

We believe this is the largest study to date in the literature for managing inhaled headscarf pins and the use of magnetic force to extract inhaled foreign bodies has not been previously described.

Foreign body (FB) aspiration remains a common problem in young children and is classically divided into organic (such as nuts and seeds) and inorganic (such as plastics, metals and toy parts). The common age groups are extremes of age (children and geriatrics) due to inadequate airway protective mechanisms. In addition, children putting objects in their mouth is a physiological way of exploring their world.

Headscarf pin aspiration is a distinct clinical entity found in countries where headscarves are used because of religious or traditional reasons. The lack of experience in wearing headscarves can predispose young women to pin inhalation. Additionally, the presence of these pins around their children can predispose them to accidental inhalation. Diagnosis is usually straightforward via a history and the presence of the radio-opaque pin on a chest X-ray. For proximally located pins in the trachea and main bronchi, the treatment is extraction using a rigid bronchoscope and less commonly a flexible bronchoscopy.

For more distally located pins, few manoeuvres are available to try to avoid conversion to a surgical procedure (VATS/mini-thoracotomy). A flexible bronchoscope can travel into more distal airways to locate and aim to move the pin to a more central position. The flexible bronchoscopic grasping forceps can extract the pin only in the adult population due to the size and strength of the grip. Fluoroscopy has been successfully used as an adjunct in distally located pins to confirm the pin’s location and aid its removal. Our modified technique has allowed extraction of distally located pins without the need for the previous manoeuvres although pins with penetration into the lung parenchyma are beyond the reach of any bronchoscopic extraction.

Forcefully bending the pin using the endoscopic crocodile was the commonest method used in our classic approach to extract tracheobronchial pins. The reason behind this is that a large proportion of pins become transversely impacted in the airway due to the sharp tail end of the pins or their partially lying in a lobar bronchi, hence putting them in a longitudinal position becomes more difficult. The length of the pin is larger than the diameter of any rigid bronchoscope. Additionally, extracting a transversely impacted pin without bending it or transferring it to a longitudinal position can seriously injure the airway. We had to use the same technique of bending in 10% of patients as an adjunct to the new modified magnet technique. We advise in cases of bending the pin to bend it towards the free sharp tail end of the pin to avoid dislodgment of the other side pin’s head if its end is forcefully bent through the bronchoscope. This can result in distal migration of this tiny plastic piece with difficult extraction in adult airways due to its larger diameter.

In cases of unsuccessful endoscopic retrieval, surgery is indicated. The rate of need for surgery in the literature varies from 1.6 to 18%. The majority of patients in our series were operated on by VATS or a mini-thoracotomy. Choice of the surgical procedure depended on the location of FB and the surgeon’s expertise. Pneumotomy, bronchotomy and parenchymal resections are different surgical procedures used for pin removal. In our series, treatment was always conservative, and no resection was needed. We advocate the use of pneumotomy rather than bronchotomy whenever possible to avoid the hazard of postoperative bronchial stenosis. This is always possible if the pin is distally located outside the reach of the fibre-optic bronchoscopy as its palpation and extraction via a pneumotomy is feasible.

During surgical resection of distally migrating pins, we advise to completely deflate the lungs (preferably using a double lumen tube) as digital palpation is the mainstay of locating the pin. This is usually necessary even when operating via thoracoscopy.

Other studies used intraoperative fluoroscopy/fibre-optic bronchoscopy in seven (25%) out of 28 operated patients to localize the pins that could not be palpated. We did not find this necessary.

The evolution of the new technique has resulted from a number of points. First, we had 8 cases (4.1%) complicated with dislodgment of the headscarf pin’s head while bending it through the rigid bronchoscope and in half of them we were unable to extract the pin’s head due to distal migration. Our belief was that follow-up of this tiny retained FB was enough and we have not observed any complications during a reasonable follow-up period. Avoiding this vigorous bending manoeuvre through the power of the magnet was an attractive option. Secondly, we had a 4.8% conversion rate to VATS/mini-thoracotomy in a group of patients in whom the majorities are young females where cosmetic concern is an issue. Finally, the concept of using a magnet to extract metals is a logical principle that was worth exploring in the airway.

The use of magnetic force to remove FBs from different human tissues is a well-known concept. The principle has been used in removing intro-ocular foreign bodies. It was successful in removing paediatric nasal impacted metal objects. Magnets have been used to remove metallic FBs from the hand, forearm, forehead and buttocks. The concept of using a magnet to extract ingested metallic foreign bodies was described by Volle et al. nearly three decades ago as they attached a magnet to a naso-gastric tube. We have applied the same principle in the airway using our modified technique for inhaled pins.

The strength of the magnetic force is to be considered in our technique. We have chosen two small magnets of 3 mm diameter each for our device. The reason for this was that the magnetic field created to attract the pin using one magnet was 13 mm while using two magnets was 15.3 mm. Our radiologists advised us that a pin beyond 15.3 mm from the most distal airway point has probably penetrated the lung parenchyma and is beyond bronchoscopic reach. We are now looking forward to making our magnetic homemade device stronger by adding an electric current through it, a physical concept which has been utilized in medicine in magnetic resonance imaging.

With the introduction of our modified technique, we have observed the following: (i) The procedure was simple and shorter with no need to use the crocodile for extraction in most cases. (ii) We have avoided the need to forcefully bend transversely impacted pins using the metallic crocodile into the lumen of the rigid bronchoscope as the magnetic force can transform the transversely impacted pin into a more longitudinal position allowing it to travel through the bronchoscopic lumen attached to the magnet. (iii) Metallic pins that have migrated beyond the rigid bronchoscopic view into terminal airways can be forced into a more proximal location and be extracted via the magnet or using the classic crocodile. This may avoid the need for surgical thoracotomy/VATS where pin penetration has not yet happened.

The limitations of our study include a mixture of paediatric and adult patients and a relatively small number of patients in whom
the new technique applied on in comparison with our classic approach but we do expect the technique to be more widely applied in our centre and other centres. The need to convert to a surgical procedure may well be present in further patients where penetration of the pin has occurred. The technique cannot be applied in young children. The potential complications of the new technique include dislodgement of the magnet and injury to the airway with the pin movement. Although this is our experience with the first 20 patients using the modified magnet technique, we feel the safety of the modification is confirmed. The durability and strength of the magnet is expected to lessen with time and we plan to redesign the same device on an annual basis.

We believe that the simplicity and safety of our modified technique should encourage bronchoscopists to adopt it while educational programmes should be implemented nationally for young females to educate them on how to avoid the inhalation of headscarf pins.

**CONCLUSION**

The novel technique of bronchoscopic extraction of tracheobronchial inhaled headscarf pins using homemade magnets, was safer and simpler in comparison with our large experience with the classic approach. We have avoided the need to bend the pins through the bronchoscope with the risk of distal dislodgement of the pin’s head. Additionally, we have avoided the need to convert the bronchoscopic procedure into a surgical one (mini-thoracotomy/VATS) in distally migrating pins. Hence, we advocate the use of this instrument (or concept) in selected patients in centres dealing with headscarf pin inhalation problems.

**Conflict of interest:** none declared.

**REFERENCES**


**APPENDIX. CONFERENCE DISCUSSION**

Dr L. Luzzi (Siena, Italy): I have just two questions. Did you find any pins that were not paramagnetic, in other words that you couldn’t catch because they were not magnetic? They are made by new materials probably. We also have materials that are not paramagnetic.

Second question is, for sure your technique does not exclude the use of the crocodile. Probably the combination of the two technique is the goal for the treatment of these cases and in this way probably you can resolve all cases without surgery.

Dr Elsayed: For the first question, finding a pin which is not attractive by magnet, no, all of them were attractive by magnet. They are the old metal stuff that is used. There is no new plastic stuff that is used for these headscarf pins. They are probably all the same, like the ones I’ve shown in the picture, the one that was bent. Just the head comes probably in different colours, but its all magnetic-attracted or magnetic-sensitive.

For the second question, you are absolutely right. We have done 20 cases and we have used the crocodile in 2 of them. In both of them the pin was distal and the magnet could probably just attract a small bit that you can see, but it becomes impacted in the airway and you need to bend it to take it out. Sometimes the pin, it’s in front of either the trachea or one of the main bronchi, and the magnet goes in and just takes it out, but sometimes it’s a bit more complicated than that, especially in adult airways where it can go a bit more distal. The picture of the X-ray I have shown was for a child, and those are much easier, because the pin cannot escape distally because the airway is smaller in diameter, but in larger airways in adults where the pin can go further, yes, absolutely there is the need to use a crocodile. But I think the concept here is that if you do not need to use a crocodile and you can just take it out with a magnet without bending, it is less traumatic. In the paper we have written, we have seen 8 cases of head dislodgement into the distal airway while bending the pin. We have learned with time how to avoid that. We try to avoid it by bending the bit which is away from the head, because if you bend the bit which is closer to the head, it can come on the edge of the bronchoscope and dislocate it. So by time we have learned it, but with the magnet you can just avoid all this hassle.

Dr T. Lerut (Leuven, Belgium): You have proven that surgeons are creative people. But, as you said, the concept is not new, the location is new, and the concept, exactly one century ago, Harvey Cushing, when he was working in the First World War in Flanders Fields, designed a strong magnet to extract shrapnel and metal pieces out of the brain. So that is a historical note. What he did was, in order to not create more damage and to stay in the track of a bullet or shrapnel, he put a pin like this on the magnet so that the metal made contact with the pin, and then he could extract the whole thing. That brings me to the idea that if you enlarge your magnetic field for the very distal ones, perhaps you could try to design the same principle by bringing a pin through your bronchoscope that makes contact with a hopefully strong magnet and then make contact with the metal pin more distally. It’s just a comment.

Dr Elsayed: That’s a great idea. We are trying to innovate more now and some of the metal companies are trying to contact us on ways of trying to get this magnet stronger. Probably what we will maybe try to do this year is to try to get electricity in the magnet. This is the concept of increasing the power of the magnet by electric fields. This is probably something like the concept of magnetic resonance imaging. But, obviously, this needs safety and it needs to be designed in a way that will not harm. So, yes, trying to get the magnet stronger can be one of our aims in the future.

Dr K. Bostancı (İstanbul, Turkey): Actually, culturally, we have the same problem. We sometimes remove those pins. Maybe I missed it. Do you ever use fluoroscopy?

Dr Elsayed: We actually do use fluoroscopy in distally-migrating pins. Probably this was beyond this series of talks. Our use of fluoroscopy, it’s probably written in the manuscript, but it’s in the range of about 1%. In the series of 326 procedures, we needed to perform 15 operations, a VATS or a minithoracotomy. Before performing these operations, there was a trial of fluoroscopy which failed. The trials of fluoroscopy which succeeded were about 4 cases in distally-migrating pins. You go in with a bronchoscope. We don’t use fluoroscopy at all as a routine, but if you go in and you cannot see the pin, we can get the fluoro machine and you can see the crocodile. Obviously there is no place for any magnets here or anything. You need a crocodile and you need just to put it on the tip of the pin if you can see it through fluoroscopy, and that will need probably to be bent out. So, yes, it is a tool that we use in distally-
migrating pins, which I think a magnet will not be helpful here, because it has gone beyond the range of the bronchoscope.

**Dr Bostanci:** We always use fluoroscopy for distal pins. Why do you feel the need for bending the pin? We always either hold the ball or the tip. Isn’t it a bit risky trying to bend a metal pin inside an airway?

**Dr Elsayed:** Over these 10 years of experience with 326 pins, we can assure you that there are some pins which you are not going to be able to just hold the tip or hold the head. They are impacted in the airway, especially in young children. They are impacted on both sides and there is no way you are going to be able just to see one edge of it. We have tried that a lot of times. A lot of our population, unfortunately, are kids and they have got small airways. Let me just get you the X-ray (Slide).

You can see this. If you go in with a bronchoscope and have a look here, you may find that with this small airway and with this large, in relation, pin, it’s just impacted transversely and you cannot see either of the tips of it. The magnet here may be helpful in attracting a negative pressure which the crocodile forceps, the jaws are too weak and small to hold this pin.

**Dr Elsayed:** In this case, probably we would hold the needle, push it a bit forward, remove it from the bronchus, and then pull it back.

**Dr Elsayed:** I think that’s fair. We try that a lot. Actually, whatever you try, you try to take the pin without bending, definitely without bending, but sometimes in these young children it is not possible except to take it out bent.

**Dr S. Alnasser** (Riyadh, Saudi Arabia): We face these kinds of cases, which is not uncommon, but I found with this kind of technique that you need to use general anaesthesia and rigid bronchoscopy in all patients to do it, while with flexible bronchoscopy and sometimes just under sedation and local, you can do it without any problem.

The other thing, sometimes the head of the pin is made of plastic. Sometimes when it is impacted distally, the only thing you see during bronchoscopy is just the head of this pin. So you cannot use the magnet. Sometimes other kinds of techniques, like those used in urology, ureteric stone removal, you can go around just the head and you catch it and take it out.

**Dr Elsayed:** Do you mean the head dislodged or the whole pin is inside?

**Dr Alnasser:** No, no, the whole pin is inside. The only thing you see during bronchoscopy is just the plastic head with the pin, which is a plastic material and you cannot use a magnet with it.

**Dr Elsayed:** I think when you put this magnet in, it either comes out with the pin easily or it doesn’t, and if it doesn’t, you are just going to have to find another way of taking it out, probably the classic way. Usually, even if the head of the pin is in front of you, you will be able to put the magnet in and the metal part will contact the magnet even if the head is in front of you because you have got a magnetic field of more than 15 mm. So you’re close to that.

For the second question, fiberoptic bronchoscopy, we have tried that. We even did a trial to compare extraction of those pins with a rigid scope versus a fiberoptic bronchoscope. Especially in the pediatric population, when you put the fiberoptic bronchoscope in and you put the crocodile forceps of the fiberoptic bronchoscope in, it won’t come out because the jaws of the fiberoptic pediatric bronchoscope cannot be strong enough to hold that pin.

**Dr Alnasser:** Yes, but this is the rigid. If you use the flexible pediatric biopsy forceps, you can easily hold it if it is the tip of it.

**Dr Elsayed:** If it is a fiberoptic pediatric bronchoscope and you use the crocodile forceps, the jaws are too weak and small to hold this pin.

**Dr P. Krysiak** (Manchester, UK): I don’t have a question but just a comment. We have been involved with retrieval of various foreign bodies from airways, and sometimes it is very difficult to find them, because if they have been in there for a time, the airway is swollen and you can never see beyond the swelling. We have in the past used Dormia baskets put in under fluoroscopy. And sometimes you can see the objects under fluoroscopy. Sometimes it will be dental fillings or pieces of plastic. These have not been available to us for a period of time now because they have stopped making them in that fashion, but I think Cook produced a similar device to retrieve broken-off plastic catheters, intravenous catheters, which cardiologists use, so it’s worth remembering that when retrieving foreign bodies from airways.

**Dr Elsayed:** We have used them. They are very good. Thank you.

**Dr. D. Waller** (Leicester, UK): I would suggest that you have a major public health problem in Egypt. I think you need a health education program about the dangers of hat pins possibly. Treat the cause rather than the effect.

**Dr Elsayed:** We are on that now.

eComment. Scarf (veil) pin inhalations

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I read with great interest the article by Elsayed et al [1] and have a few comments. First of all, I believe that veil pin inhalation is a major health problem in Muslim countries where adult females are used to covering their heads. This is why a lot of reports come from Egypt, Turkey, Saudi Arabia, Kuwait and Jordan.

Secondly, a single technique, however excellent, may not be enough as a lone technique and hence a lot of manoeuvres and technical tricks may be needed prior to deciding to do either a thoracotomy or video-assisted thoracoscopic surgical (VATS) removal of the inhaled foreign bodies, such as the use of the forceps, dormia basket, postural drainage without using the forceps and or a magnet [1-2]. The role of redo and even repeat redo bronchoscopy may need to be emphasized. I have a question about the safety of this novel technique described in this paper in the presence of metallic valve prostheses, pacemakers or oesophageal clips? Again, I congratulate the authors on their excellent work.

Conflict of interest: none declared.

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